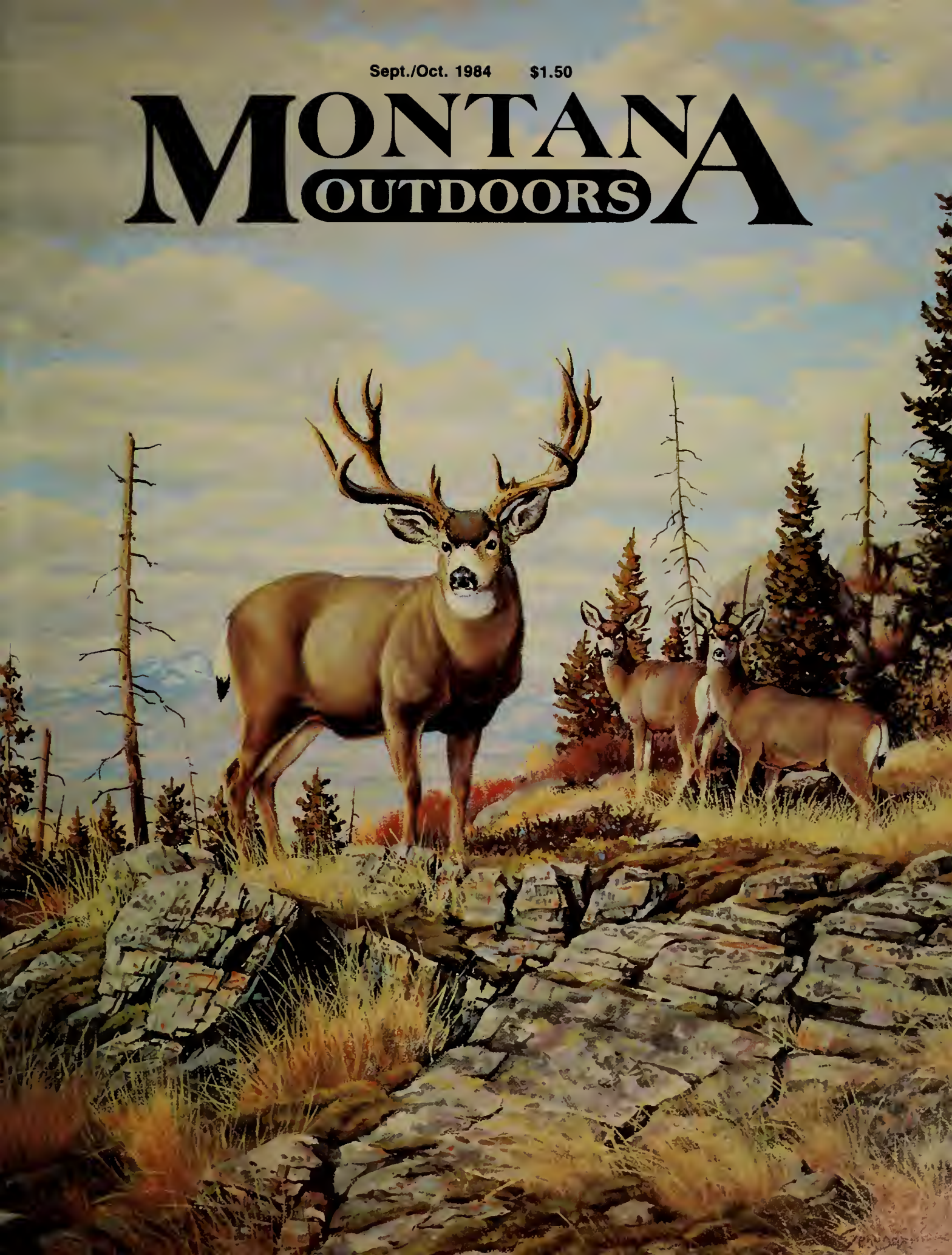
Sept./Oct. 1984 $1.50

MONTANA OUTDOORS



"Evening is almost always the best time, and big brown trout have always moved with approaching darkness. Even in midsummer they make wakes in the tails of pools at dusk. In fall, most of the streamer throwers make special efforts to be at a favorite spot when the shadows reach midstream, and there have been several places where my evening presence has become a ritual. . . . When the mountain's shadow had crossed the river, I would check my knots and almost exactly at that time I would invariably hear the thudding splash of a brown trout leaping free somewhere in midstream, a signal that the time had come."

—Charles F. Waterman,
"Ridge Runners and
Swamp Rats"

MONTANA OUTDOORS

Sept./Oct. 1984, Vol. 15, No. 5
(USPS 360 280)

Front Cover
The mule deer is Montana's most popular and sought-after big game animal. But its aesthetic appeal—beautifully shown in Elmer Sprunger's painting—and the diversity of country it inhabits make it a favorite of the non-hunting segment of the public as well.

Inside Front Cover
The popularity of the Missouri for fishing is increasing each year. Both statewide and nationally, it is becoming known as a "heaven on water" for trout fishermen. Larry Lewis' photo makes it easy to understand some of the reasons for the Missouri's rising reputation.

Back Cover
Dave Books' photo melds the three most important elements of a September day afield: a challenging target (in this case, Montana's newest game bird, the mourning dove), a well-trained dog (in this case, a Brittany spaniel), and a patient (in this case, a successful) wingshooter.

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MONTANA MULEYS

by Heidi Bailey Youmans

The mule deer typifies Montana's rich wildlife heritage. This hardy and adaptable member of the wildlife community, distinguished by its long mulelike ears and distinctive bounding gait, lives just about everywhere in the state. No other Montana big game species adapts to such a wide variety of habitats, ranging from mountain top to prairie badlands.

Montanans place a high value on the opportunity to hunt and to observe deer. In addition to being the state's most popular and sought-after big game animal, the mule deer's aesthetic appeal makes it a favorite of the non-hunting segment of the public as well. Wildlife viewing and photography are increasing in popularity as year-round recreational pastimes; a 1977 survey indicated that 70% of Montana's residents participated in wildlife-viewing activities.

Although deer hunting is no longer a necessity, it is important in terms of tradition and recreational opportunity. In 1983, 200,484 hunters spent more than 1 million days hunting deer in Montana.

A Historical Perspective

The best way to genuinely appreciate today's wildlife resources is to view them in a historical perspective. Mule deer populations have played an integral role in the quality of life of generations of Montana residents. For the Plains Indian, deer provided meat, buckskin, and other daily needs. Venison was an important food for early trappers, miners, and settlers. Between 1893 and 1900, deer hides were legal tender in Montana, with a value of 50 cents apiece.

Management of Montana's mule deer populations has gone through several transitions, with its roots in regulation of hunting harvest. In the 1860s, public opposition to uncontrolled hunting developed in the Montana Territory. Prompted by public concern about overharvesting wildlife populations, the 1872 Territorial Legislature imposed the first closed season (Feb. 1-Aug. 15) on all big game species. Game laws were not effectively enforced, however, until after Montana became a state in 1889. In 1895, the Legislature established a Fish and Game Board of Commissioners, which set a limit of eight deer per hunter.

The second step in early game management was establishment in 1879 of a predator bounty payment program by the Territorial Legislature. This action was based on the assumption that predation, combined with hunting, controlled wildlife populations. Bounty payments were not completely eliminated until 1962, although it was recognized much earlier that wildlife populations are not controlled by predators.

The Montana Fish and Game Department was established in 1901 with hiring of the first state game warden. During the early 1900s, the deer bag limit was reduced and the hunting season shortened in response to a growing scarcity of deer. By 1917, five counties in eastern Montana (Yellowstone, Rosebud, Custer, Dawson, and Richland) were closed to deer hunting; by 1921, 15 counties, mostly in the eastern half of the state, were closed. A limit of one buck deer was in force in areas still open to hunting. Habitat changes due to overgrazing by vast herds of domestic livestock and conversion of millions

GARY D. HOLMES

of acres of prairie to farmland during the homestead era undoubtedly contributed to the decline of big game populations through the 1920s.

With the exception of certain areas in western Montana, mule deer remained scarce during the 1930s and were considered extinct in parts of the eastern half of the state. In spite of preoccupation with economic woes generated by the drought and Depression of the "Dirty 30s," public concern for wildlife prevailed. The third sequential development of early game management, creation of game preserves, was implemented during this period. Establishment of game preserves was based on the premise that protection of "seed stock" on the preserve would result in repopulation of adjacent areas. By 1935, 46 game preserves, encompassing over 2 million acres, were established in Montana for the benefit of deer and other wildlife. These game preserves were gradually abolished as wildlife populations rebounded and a better understanding of wildlife-habitat relationships developed.

In 1937, the U.S. Congress passed a bill which was to be a cornerstone and turning point in the evolution of wildlife conservation in this country. The Federal Aid in Wildlife Restoration (Pittman-Robertson) Act earmarked receipts from an 11% excise tax on sporting firearms and ammunition for use by state wildlife agencies in habitat acquisition and restoration, wildlife research, and wildlife surveys. Montana became a participating state in 1941. By the end of the year, the Montana Fish and Game Department had hired more than a dozen trained wildlife biologists to implement wildlife restoration projects using the new funds. Before this, the department's function was limited to enforcement of game laws enacted by the Legislature.

The fourth major development in early game management, a game restocking program, was one of the first undertaken with Pittman-Robertson (P-R) funds. Its objective was to establish huntable populations of all game species in all suitable habitats in the state. Between 1943 and 1950, 1,286 mule deer were transplanted from western Montana to 16 sites in eastern Montana where deer were scarce or absent. The first mule deer transplant involved moving 35 deer from the National Bison Range at Moiese to badlands near Glendive. These restocking efforts bolstered mule deer populations which had already begun to increase because of favorable environmental factors.

The state's deer populations rallied during the 1940s and '50s. Some of the reasons for this increase were: improved management of livestock grazing on rangelands, revegetation of plowed rangelands abandoned during the drought years, and establishment of palatable shrubs in areas of western Montana burned during the great forest fires of the late 1800s and early 1900s. By 1955, mule deer were common throughout the state, and the statewide deer harvest (mule and white-tailed) had reached 100,000.

Beginning in the 1950s, the focus of deer management programs changed from *protection* (hunting restrictions, predator control, game preserves, and restocking) to deer *habitat requirements*. Where earlier deer management programs had addressed the problem of too few deer, the problem now was too many deer! Concerned that deer were so numerous that they were damaging their winter ranges, biologists developed a vegetation survey method to measure utilization and condition of browse on big game winter ranges. Results of these surveys were used to determine the proper balance between deer numbers and their winter food supplies.

Under a land acquisition and development program initiated during the late 1940s, the Montana Fish and Game Department purchased several critical big game winter ranges with hunting license revenues and P-R funds. The purpose of this habitat program was to improve these critical areas and to guarantee they would remain game winter range forever. In an attempt to redistribute deer and elk, biologists also tried a salting program. They believed aerial drops of salt blocks could draw elk and deer off wintering areas earlier in the spring and thus alleviate overuse of critical winter range. This assumption turned out to be false, and the program was scrapped in 1956.

In an effort to curb deer population growth, either-sex deer seasons were begun during the 1950s, amidst great public controversy. Before 1950, the tradition of hunting only buck deer had predominated in Montana, and many people felt it was unethical to harvest does or fawns. Public attitudes gradually changed, however, and the first statewide either-sex deer season was implemented in 1958. Special early and late seasons were also established to alleviate deer damage to crops. In 1957, the statewide deer harvest soared to 134,000, coinciding with a population peak.

Following a mild decline in the mid-1960s, Montana's deer populations again peaked in the early '70s. A record harvest of 136,000 was achieved in 1973. Deer populations subsequently declined, not only in Montana, but throughout the Rocky Mountain region. Reasons for this decline, which was fueled by high mortality and low reproduction, are still not well understood. Wildlife managers responded with conservative hunting regulations; by 1976,

buck-only hunting was once again in effect over most of the state.

Mule deer populations in Montana have been on an upward swing since 1978. Exceptional growth rates exhibited by deer herds in recent years are attributed to a succession of unusually mild winters which have favored high reproduction and survival. Mule deer populations have reached "all-time highs" in much of north central and eastern Montana, resulting in deer depredation problems in those areas. Liberal seasons and special early and late hunts have been implemented in an effort to curb population growth. The 1983 deer harvest reached 139,500, an all-time record.

During the 1930s, mule deer were considered extinct in parts of eastern Montana. Today, mule deer populations have reached all-time highs over much of the state, with a 1983 hunter harvest of nearly 100,000 animals.

Mule deer populations in Montana have been on an upward swing since 1978. Exceptional growth rates exhibited by deer herds in recent years are attributed to a succession of unusually mild winters which have favored high reproduction and survival. Mule deer populations have reached "all-time highs" in much of north central and eastern Montana, resulting in deer depredation problems in those areas. Liberal seasons and special early and late hunts have been implemented in an effort to curb population growth. The overall deer harvest in 1983, an all-time record, reached 139,467 animals; of these, nearly 100,000 were mule deer.

Mule Deer Management Today

Management of Montana's wildlife resource has been shaped by its ecological significance, aesthetic interest, recreational and economic values, and advancement in the science of wildlife management. A historical perspective shows that mule deer management practices during the first half of the 20th century were geared toward *responding* to deer populations rather than *managing* them. Although early management programs were well-intended, they were sometimes based on erroneous assumptions which reflected current understanding of mule deer ecology. Today's improved understanding of mule deer population dynamics and habitat relationships makes it possible for biologists to manage deer populations rather than respond to population levels on a year-to-year basis.

Mule deer management in Montana is geared toward: (1) maintaining healthy and productive deer populations within the limits of available habitat and prevailing land uses, and (2) maximizing opportunities for hunting to utilize the annual surplus in deer populations. Mule deer management goals incorporate short-term harvest objectives with long-term habitat management provisions on public lands. Successful implementation of habitat and harvest programs is aided by conservation education programs, which provide a link between the Montana Department of Fish, Wildlife and Parks and the public.

Many people still believe that game managers regulate deer populations through hunter harvest. In fact, mule deer population trends are set by environmental conditions such as habitat quality and quantity and weather. These factors determine herd condition, productivity, and natural mortality—and therefore the growth rate of the population. Wildlife managers can manage game populations only within the constraints imposed by environmental factors. Long-term deer population trends depicted on the graph on page 9 of this issue show successive "peaks" and "valleys," representing population highs and lows. Biologists strive to "adjust" population trends through regulation of annual hunter harvest: by "dampening" peaks and "filling in" valleys. Appropriate harvest objectives are determined by evaluating the status and trend of mule deer populations.

Collecting Biological Information

Deer populations and their environments compose a complex and dynamic biological system. Because populations continually fluctuate, surveys to monitor populations and trends must be conducted every year. Wildlife biologists try to determine: (1) production (fawn birth rate), (2) recruitment (survival rate of fawns to yearling age), and (3) winter mortality. Monitoring surveys also document other population influences such as habitat changes, disease, and general animal condition. These bits of information aid biologists in recommending hunting seasons to the Fish and Game Commission.

Production surveys are conducted during September and October when deer move to their wintering areas. These surveys are accomplished by aerial and ground observations. Adult bucks, yearling bucks, does, and fawns are identified. The resulting fawn to doe ratio, and percentage of the total population composed of fawns, is a measure of the herd's productivity—an expression of the population's potential to replace itself through production of fawns.

Recruitment surveys are usually completed in February and March while deer are still on wintering areas. Deer are classified as adults or fawns, and biologists determine an adult to fawn ratio. When compared with results from production surveys, this ratio indicates fawn survival over the winter. Overwinter survival of fawns and adult females determines population growth rate.

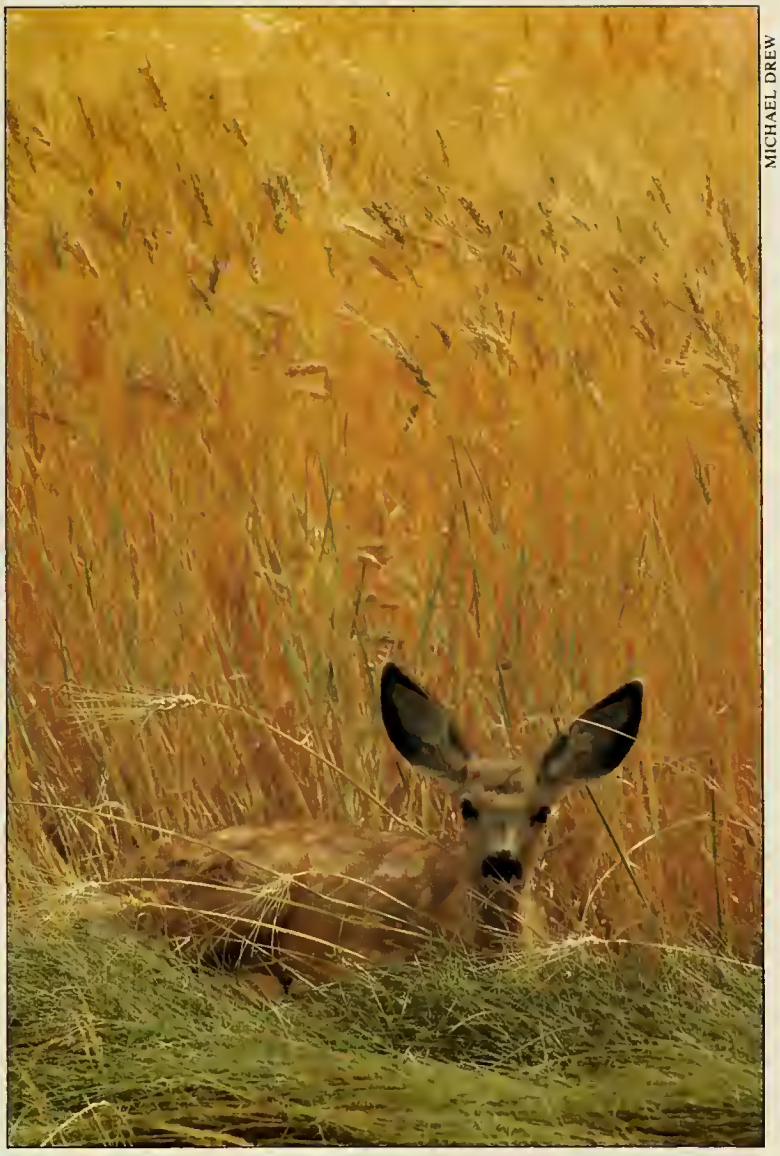
Areas that accurately mirror deer population trends have been identified in representative habitat types in many areas of the state. Changes in actual numbers of deer observed during production and recruitment surveys on these trend areas reflect changes in populations in similar habitats elsewhere.

Biologists also obtain useful information from deer that die of natural causes and from highway collisions during winter and spring. Sex and age are determined, and female reproductive tracts are examined. The number of fetuses in the uterus indicates current reproductive success, while the previous year's reproductive rate can be determined by examining the ovaries. Comparing these reproductive rates with results of production surveys (number of fawns alive in September) can indicate significant *in utero* (fetal) or summer fawn mortali-

continued on page 31

Mule deer population trends are dictated by habitat quality and quantity and by weather, not by hunting. While winter range is a critical element in deer survival, research has shown that mule deer have year-round habitat requirements.

MIKE LOGAN



MICHAEL DREW

MIKE ADERHOLD

ELK

by Bob Jensen
illustrated by Diane Nugent

Talk to just about any elk hunter, and he will tell you that this is the year he is going to kill the Big Bull. Sounds good, but unless he is one heckuva elk hunter, he is talking more "bull" than he is likely to shoot. His odds of success would probably be better buying into a poker game in Las Vegas with a background in church bingo.

Just consider elk hunting in Montana. Out of 100,000 hunters, there are about 17,000 elk killed, for a success of 17%. That means, on the average, fewer than one of five hunters bag an elk. Of the elk killed, not over 5%, or one out of 20, are big bulls. This means if you are an average hunter, you will kill an elk every five years; if you hunt for 100 years, odds are that you should kill one big bull.

Now anyone who hunts elk knows someone who has killed two, or three, or even more big bulls. So evidently there are ways to increase your odds. For even as rugged as elk hunters are, very few live to hunt 300 or 400 years.

It would seem that these hard-to-live-with-and-listen-to gentlemen must be doing something right. Maybe they know more about Mr. Bull Elk than the average guy; and, with lady luck on their side, they have a chance—slim, but better than average.

Could be the answer is to look at elk hunting as a high-stakes poker game. With the "steaks" of the game being Mr. Bull Elk's hide, I guess it could be called "Elk Poker."

As with most poker games, players come and go, but there are always a few permanent fixtures sitting in. Let me introduce you to those, and the role they play in the game.

First, there is "Mother Nature," who is the mistress of the house where the game will be played. She runs the game. She is a truly beautiful woman and Mr. Big Bull knows her every mood. She has fed him and protected him. He is as close to her as a son would be to a mother. He has seen her warm and friendly. He has also known her cold, icy silence and the harsh discipline she can mete out to the unknowing and unfortunate. Yes, Mr. Bull knows her intimately, for he has slept in her arms since the day he was born.

Above all, she will decide whether Mr. Bull will be allowed to play and if it will be the same table you sit at. If she decides to play, and lets Mr. Bull sit in the game, you must know her well enough to read her hand correctly, or Mr. Bull will hold the aces.

Now, we come to Father Time. He bankrolls the game for all the players. He sells time chips of different values for different prices. He sells warm time, cold time, snow time, wet time, dry time, slow hunting time, prime hunting time, and no time. You will need to buy all the time you can afford, because it may well decide the winner. You must spend enough time at the table to know Mother Nature's temperament and terrain. Otherwise, she will defeat you. If you are short of time, you must find someone who has spent the time to know her and will help you play the game. If necessary, you must have enough time to beat Lady Luck. And last, but not least, you must have enough time to watch Mr. Bull and study him, if you hope to nail his hide.

POKER

Like most good games, there is a dealer. Let's call her Lady Luck. She deals various cards to all the players, even slipping in a few wild cards. Don't count on her, but court her favors, in hopes that she will throw a few good hands your way. You increase your chances with Lady Luck by buying in at the right time and place. In other words: Hunt the grassy parks at dawn and dusk, know where the elk passes and trails are, and know how to utilize them. Take advantage of snow and cold. It cuts down on the area Mr. Bull can graze and travel. Lady Luck is a fickle thing and gives her favors by her moods. There are times, if it wasn't for bad luck, you would have no luck at all. Ah, but she may also smile so brightly that even a blind hog can pick up an acorn.

At last we come to the gambler you most want to beat. He is the last of the high rollers, Mr. Big-horned Bull. He is the most serious player in the game. If he plays right, he gets more time to enjoy Mother Nature. But if he plays wrong, he may be dead wrong.

Mr. Bull has bought plenty of time or he would not be the great player he is. Look at him closely, because he has played in Mother Nature's house at least six full years, or 2,190 days. If you consider the length of the hunting season, he has sat at the hunter's table over 365 days, or 36 10-day hunts. He has played against Lady Luck, Father Time, Mother Nature, and Wily Hunter, beating tough odds since the day he was born.

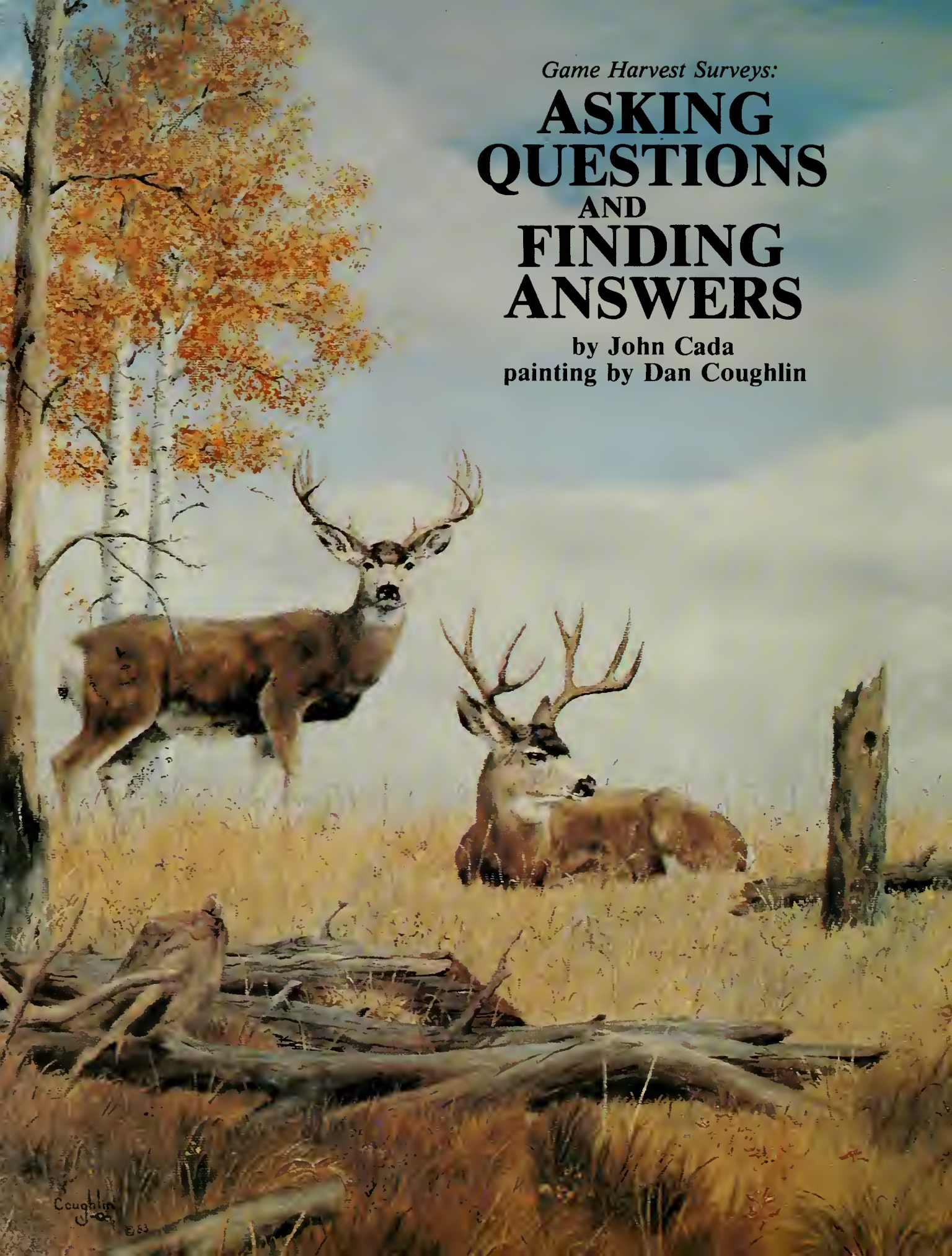
Granted, you have a higher I.Q. and can probably beat him at chess or bridge, but you are playing Elk Poker and you are playing on Mr. Bull's turf. If you confront him, he will put everything in the pot and try to win the hand, for he has the courage and stamina to play for keeps, just as long as Mother Nature lets him in the game and Father Time gives him chips. He is not afraid of Lady Luck because his skill has always seen him through the tough hands.

How can you, a tinhorn, play such a great adversary? You must attack his every weakness. He loves Mother Nature and his need for her is strong. When the cold is fierce and the snow is deep, he must have her sunshine and southern slopes for warmth and will seek her windswept slopes where the grass is easier to come by. When the wind is strong, or the hunter near, he must hide in her bosom where it is safe and warm.

Like all great gamblers, he has an Achilles heel. He has played and won so many times that his play has certain patterns. He will feed at certain times and places. He will use certain areas for refuge and escape, depending on old habits to see him through.

Father Time has been good to him, but as he plays out all his warm time, he is forced to play more cold time and snow time. He is restricted to the area he can survive in and thus has less room to escape the game. Although Mother Nature and Father Time have protected him, they also are in the game and may raise the ante until he is forced to play a hand against the odds. That is the best you can hope for.

And now, my gambler friend, as you buy your chips from Father Time, spend wisely and watch the face of Mother Nature, so you may better read her hand. And as you look across the table at Lady Luck, she may smile and deal you a hand with which you can lock horns with Mr. Big Bull. If Lady Luck should keep smiling, when the chips are all in and the cards are all down, just maybe you might catch Mr. Bull dead wrong. ■



Game Harvest Surveys:

ASKING QUESTIONS AND FINDING ANSWERS

by John Cada
painting by Dan Coughlin

In the book of Matthew, it says: "Ask and it shall be given you." There is a lot of down-to-earth wisdom in that statement, and there is also some application for the Department of Fish, Wildlife and Parks. The department is responsible for managing all resident wildlife in the state; the ability to do this job relies heavily on the amount of knowledge we are able to acquire about a species. Much of this knowledge is obtained by scientific field studies. However, a great deal of information is available just for the asking—and the department does a lot of that.

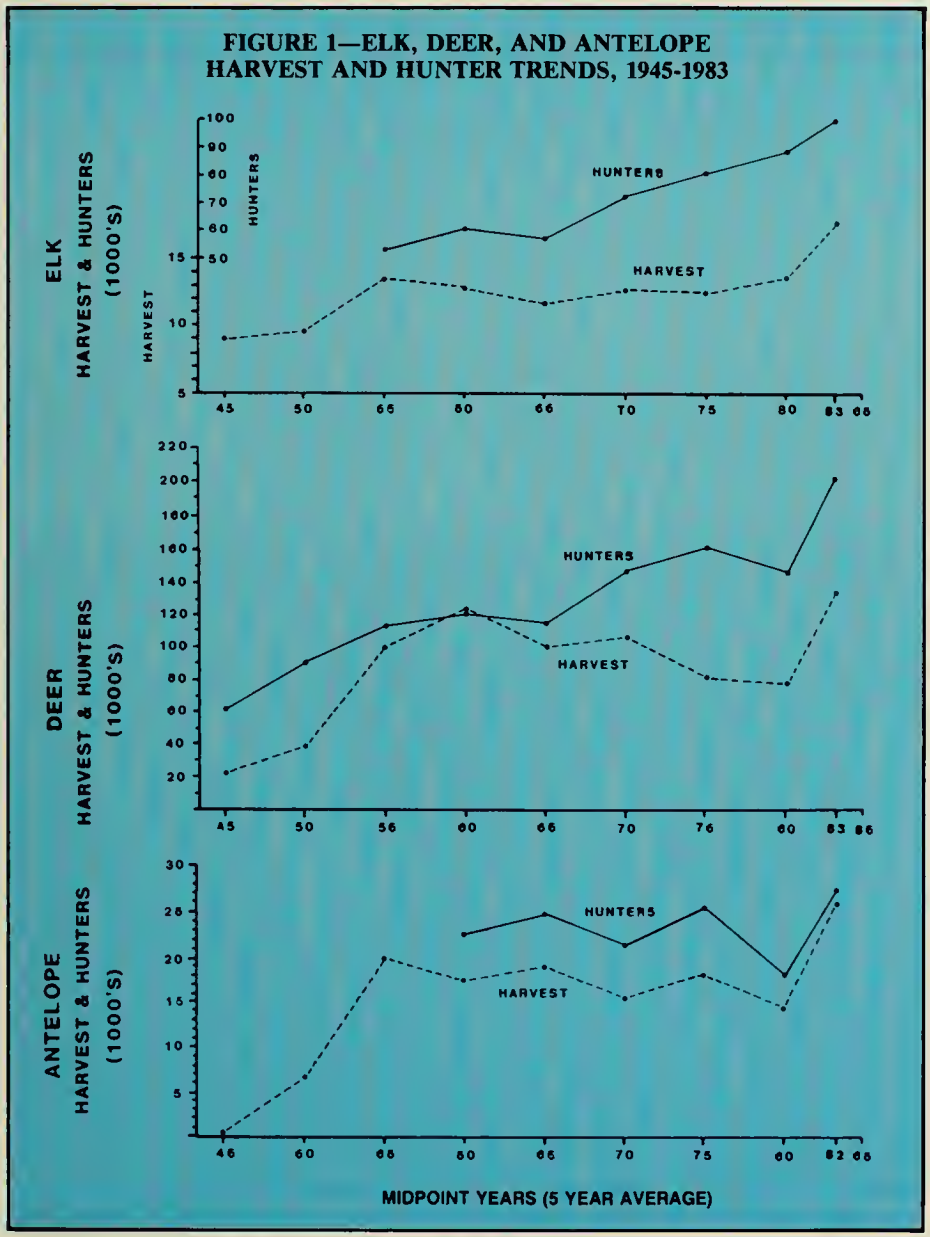
Since the late 1940s, the department has conducted statewide harvest surveys for each game species and season type in Montana. The information gathered is used to evaluate wildlife management programs and aid in formulating new ones. Considering there are 10 species of big game animals, 12 species of small game animals, and 12 species of fur-bearing mammals in Montana and the fact that the state is divided into as many as 200 hunting districts per species, the job of obtaining accurate harvest and hunting information for each species by hunting district is enormous.

License Information

Although the actual survey is conducted after the general hunting season, a lot of work must be done beforehand. It begins in April when the new conservation licenses and hunting tags become available through approximately 440 license dealers throughout Montana. As copies of these licenses are remitted to the department, they are keyed into large computer files. Since the license sales continue until the end of the general hunting season, it is December before the license files are ready for use in the survey.

Last year (1983) 291,129 conservation licenses and 459,001 hunting licenses (tags) were sold to Montana residents. In addition, nonresident hunters purchased 34,733 hunting licenses. Included are 27 different hunting license types such as archery, deer "A", moose, upland game bird, etc.

FIGURE 1—ELK, DEER, AND ANTELOPE HARVEST AND HUNTER TRENDS, 1945-1983



Sampling

Fortunately, for department purposes, reliable harvest estimates can be obtained by surveying only a portion of the license holders. The number of people to be surveyed, however, must be arrived at through a statistical process which considers the level of accuracy desired and size of the group from which the sample is to be taken. The percentage of license holders sampled ranges from 100% in some of the small surveys to about 10% in the larger ones.

The largest group of sportsmen surveyed is the 150,000 resident deer "A" license holders. Statisticians have determined that 25% of this group must be sampled to obtain reliable results. The reasons for this seemingly large sample are that general license holders can hunt in any one or more of the 200 hunting districts in Montana and harvest estimates must be accurate to the hunting district level. If we were interested only in a statewide estimate, the sample size for this survey could be only 1% or 2%.

Once sample sizes are selected, the actual number selected from the license files has to be adjusted upward by a certain amount because some sportsmen don't respond and others are not available. For example, to obtain a 25% sample of general deer license holders, we try to contact 40% of them.

Samples are drawn in late December when approximately 90% of all license sales have been remitted to the department.

The Survey

The survey is accomplished in two major phases: resident and nonresident. The primary difference between them is the method of collecting information. Before 1981, all harvest surveys in the state had

TABLE 1—DEER HARVEST ESTIMATES FOR HUNTING DISTRICT 341, REGULAR SEASON, 1983

	Permits issued	% Success	Hunter days	Hunters	Total harvest	Mule Deer			Whitetail		
						Buck	Doe	Fawn	Buck	Doe	Fawn
Resident											
Deer "A"		50	1463	175	88	76	0	0	12	0	0
Deer "B"	98	32	473	98	31	0	23	6	0	2	0
Nonresident											
Deer "A"		50	99	12	6	6	0	0	0	0	0
Deer "B"	2	0	9	2	0	0	0	0	0	0	0
Combined											
Deer "A"		50	1562	187	94	82	0	0	12	0	0
Deer "B"	100	37	482	100	37	0	23	6	0	2	0

been conducted by mail questionnaire. Based on a study in 1980 which compared telephone and mail questionnaire methods, we concluded that for surveying Montana residents the telephone method would save approximately $30,000 annually, have fewer sources of bias errors (for example, non-responses by unsuccessful hunters), and be preferred by Montana sportsmen. Consequently, since 1981, the entire resident portion of the statewide harvest survey has been conducted by telephone (with some minor exceptions).

Although the telephone method is preferred, it is more complicated to conduct. Approximately 100 telephone interviewers are strategically located in 40 larger Montana towns so that as much of the survey can be conducted by local calling as possible. An additional 25 interviewers are based in Bozeman; they cover the remaining Montana communities by long distance calls. Due to errors in phone numbers or inability to reach individuals by phone, the contact rate for the phone survey is about 70%. However, once contacted, sportsmen are exceptionally cooperative. Less than 1% of the sportsmen called indicate they do not want to cooperate with the survey.

The questionnaires used for the phone survey are identical to those used in the mail survey. Most contain from five to seven questions, depending on the license type. All ask if the sportsman hunted, number of days spent hunting, if a kill was made, and the age, sex, and time of the kill. Questionnaires for the general license holder also ask where the respondent hunted and location of kill.

The upland game bird and waterfowl questionnaires contain more questions, since they cover several species and seek monthly hunting information on waterfowl.

Phone questionnaires for general license holders take about one minute to complete; game bird questionnaires take about five minutes. Since phone numbers to be called are sorted numerically, most of the time each household will be called only once per year (even though there may be several questionnaires for individuals living there). The average is about two questionnaires per household. However, as many as 10 questionnaires have been appropriate for some households.

The phone survey begins in late January. It takes about six weeks to complete approximately 90,000 interviews. In most years, the phone survey ends in mid-March.

Time zone differences and long distance costs make the telephone method for nonresidents impractical, so we continue to conduct the nonresident survey by mail. About 25,000 questionnaires are mailed in early February and by early March, approximately 90% of those who will respond have done so. About 60% of the nonresidents respond to the mail survey, which is considered excellent when compared with most other kinds of mail surveys. In fact, when Montana residents were surveyed by mail, some response rates were as high as 80% and 90%. This excellent rate of return illustrates the high degree of interest and cooperation sportsmen have in wildlife management in Montana.

As we obtain information from both surveys, we enter it into a computer for data editing and analysis. Normally, this takes about a month after the survey ends. Once the data are summarized, all questionnaires and raw data files are destroyed to maintain a high degree of confidentiality.

Survey results usually become available

continued on page 17

Table 2—HARVEST ESTIMATES FOR GAME SPECIES IN MONTANA AS DETERMINED BY THE 1983 STATEWIDE HARVEST SURVEY

Species	Hunters afield	Harvest	% Success
Deer	200,484	139,467*	70
Elk	99,198	17,022	16
Antelope	27,485	26,438	96
Moose	567	481	85
Sheep	675	336	50
Goat	290	189	65
Black bear	13,062	1,820	14
Turkey	3,912	1,750	45
Archery	15,236		
White-tailed deer	7,855	795	10
Mule deer	9,949	1,442	14
Elk	9,970	578	6
Antelope	631	127	20
Black bear	1,526	101	7
Sharp-tailed grouse	11,458	70,186	—
Sage grouse	9,956	44,404	—
Blue grouse	10,413	32,491	—
Ruffed grouse	9,461	38,599	—
Franklin's grouse	4,066	7,726	—
Ringneck pheasant	23,387	122,547	—
Hungarian partridge	6,001	28,506	—
Chukar partridge	51	649	—
Mourning dove	135	320	—
Snipe	94	309	—
Duck	16,326	178,607	—
Geese	11,489	30,078	—

* 98,396 Mule deer and 41,071 white-tailed deer

Unusual Disease Claims Bighorns

The carcasses of two mature bighorn sheep rams found in a mountainous area west of Choteau in January signaled the beginning of an investigation into an unusual source of mortality to one of Montana's most prized wildlife species.

Before finding the two dead rams, Department of Fish, Wildlife and Parks biologists had learned of a pneumonia outbreak in Alberta's Waterton National Park that killed 70% of the bighorn sheep herd during 1983. The disease spread into adjacent Glacier National Park and caused sheep deaths there also.

With the uncomfortable realization that what happened in the north country could easily happen to Montana's Rocky Mountain bighorns, department personnel watched for signs of trouble. Specific pneumonia symptoms that wildlife workers looked for included coughing, mucus around the nose, inactivity, and poor body condition.

Because the two ram carcasses showed pneumonia symptoms, they were transported to the Department of Livestock's Veterinary Research Laboratory in Bozeman. Diagnostic test results showed that pneumonia was a contributing factor in the death of one ram and probably caused the death of the other. Autopsy results also showed the rams were infected with a lung parasite commonly called lungworm. This latter finding was not totally unexpected. Bighorns inhabiting Montana's Rocky Mountain Front normally are infected with lungworms, apparently with little consequence. However, under stress, bighorns can die from the cumulative effects of poor body condition and a high lungworm infestation.

What part the lungworm infestation played in the deaths of the two rams couldn't be definitely determined, although it was most likely a contributing factor.

To minimize effects of stress on the remaining bighorns along the Rocky Mountain Front, the department issued news releases urging the public not to disturb them.

While additional diagnostic work was conducted on the rams to isolate the bacterium responsible for the pneumonia, intensive aerial surveys were planned to document the extent of sheep deaths along a portion of the Front extending west of Dupuyer to west of Augusta. However, Mother Nature had different ideas—snowstorms and high winds kept department biologists from doing aerial surveys for weeks at a time.

In the meantime, the word from the Veterinary Research Laboratory in Bozeman was that the rams had died from the cumulative effects of pneumonia caused by *Pasturella* bacteria and lungworm—the same disease that killed Waterton and Glacier bighorns.

The reason for the pneumonia-lungworm disease appearing first among older rams was attributed to their weakened condition following the rutting season.

Ground surveys disclosed additional dead bighorn sheep in the Sun River area west of Augusta. Subsequent diagnostic work at Bozeman confirmed pneumonia-lungworm disease as the cause of death.

As quickly as weather permitted, the department's helicopter was put into service. Only a few sheep carcasses were spotted. However, lower than usual lamb to ewe ratios in some portions of the Front led wildlife biologists to conclude that a substantial portion of the lambs born in the spring of 1983 had died from effects of pneumonia-lungworm disease.

To gain more precise information on the disease, five rams and 12 ewes were trapped near the upper end of Gibson Reservoir and transported by helicopter to the Sun River Wildlife Management Area headquarters. During early April, Department of Livestock veterinarians, a parasitologist from the Veterinary Research Laboratory in Bozeman, and several department employees carefully examined, aged, and weighed each sheep. Blood and lung mucus samples were tested for a variety of diseases, while fecal samples were tested for internal parasites.

Personnel working on the sheep believed that if the general health of the animals could be improved by treating them for lungworm, the additional hazard of the pneumonia could be greatly reduced. Treatment with medicated salt blocks was considered, but rejected because infected sheep could probably transmit their bacterial infections through the saliva left on the salt block. Biologists decided to treat the bighorns with medicated pellets formulated to combat lungworm. Before treatment began, eight of the penned Sun River ewes were transported to Bozeman. Five were confined in a clinical facility, and three were placed in isolation. Regrettably, the five ewes died, from a combination of acute *Pasturella* pneumonia, stress due to shipping, and confinement in close quarters. The three isolated ewes survived and readily accepted the medicated pellets. (At this writing, the effectiveness of the medicated pellets in treating lungworm has not been determined.) Meanwhile, the nine sheep

HARLEY YEAGER

A number of bighorn sheep along the Rocky Mountain Front have died from a combination of lungworm and pneumonia. Biologists trapped several sheep last spring near Gibson Reservoir in an effort to learn more about the pneumonia and to test the effectiveness of medicated pellets in combatting lungworm.

confined at the Sun River holding pen rejected pre-conditioning pellets intended to condition them for eating the medicated pellets. Since the ewes were close to lambing, additional samples were collected and all nine sheep were returned to the wild.

Because approximately 40 bighorn sheep carcasses were found and lamb numbers appeared low, wildlife biologists recommended reducing the number of ram permits in all sheep hunting districts along the Rocky Mountain Front. Fewer ewe permits were recommended for Hunting Districts 421 and 422, the two areas hardest hit by the disease.

Only time will tell how long pneumonia-lungworm disease will persist in Montana's bighorns. As additional surveys are done, the Department of Fish, Wildlife and Parks will have a better idea about the number of sheep lost to this disease.—*Harley Yeager, Region 4 (Great Falls) information officer*

Duck Stamp's 50th Anniversary

America's waterfowl were in deep trouble in the early 1930s due to market hunting and wholesale draining of wetlands. These problems were aggravated by years of devastating drought that had left marshes and ponds dry and turned much of the Midwest into a vast "dust bowl."

President Franklin D. Roosevelt responded by naming Jay N. "Ding" Darling—a political cartoonist and conservationist—to a three-man wildlife restoration committee, along with famed ecologist Aldo Leopold and magazine editor Tom Beck. What was needed, the group quickly concluded, was $50 million to purchase threatened waterfowl habitat.

Ding Darling's efforts climaxed on March 16, 1934, when Congress enacted the Migratory Bird Hunting Stamp Act, which came to be known as the Duck Stamp law. Under the new law, every waterfowl hunter 16 years of age or older had to buy a federal Duck Stamp. The revenues generated by the annual stamp sales went into a special Migratory Bird Conservation Fund to be used to buy and lease waterfowl habitat.

Since that first Duck Stamp—designed by Ding Darling himself—was produced in 1934, more than 85 million of the stamps have been sold, pumping more than $240 million into the land acquisition program for the National Wildlife Refuge System. What was once a loose collection of refuges scattered across the country is now a 417-unit network encompassing nearly 90 million acres of land with a well-defined purpose and a continuing financial base—the largest system of lands intensively managed for wildlife anywhere in the world.

Non-hunters and a growing number of stamp collectors are also discovering the Duck Stamp. The Interior Department encourages outdoor enthusiasts who enjoy wildlife through photography, bird watching, and other activities to join hunters in supporting the nation's conservation effort by buying an annual Duck Stamp. This year's stamp, which features a pair of American wigeons drawn by Alabama artist William C. Morris, is currently on sale for $7.50 at post offices across the country.

Black or Grizzly Bear?

With several bear seasons opening in September (check with the Montana Department of Fish, Wildlife and Parks, 1420 E. Sixth Ave.; Helena, MT 59620, for details), it is imperative that hunters positively identify their target before shooting. Between 1975 and 1983, the department documented nine grizzly bears killed because they were mistaken for black bears. These mistakes seriously threaten the limited grizzly bear season in Montana, as well as the spring black bear season.

It is not always easy to distinguish between black and grizzly bears. Color and size are not dependable criteria, so other features must be looked for, such as overall profile, shape of the head, line of the back, and claw length. As a hunter, it is your responsibility to make a positive identification. If you are not sure, don't shoot!

Look for a combination of characteristics to make identification

BLACK BEAR

1. No prominent shoulder hump. Highest point of body is the back.
2. In profile, muzzle is straight and long. Frontally, head and face appear round.
3. Claws dark, much shorter and more curved than grizzly claws.

GRIZZLY BEAR

1. Highest point of back is a muscular hump over the front shoulders.
2. In profile, distinct brow gives "dished" look to face. The brow is not as well defined in yearlings.
3. Front claws are long, very prominent, and often light colored. Can sometimes be observed from great distances.

"Share The Outdoor Tradition"

Often the only thing separating non-sportsmen from hunters and fishermen is that they've never had the opportunity to experience the excitement and rewards of the outdoor tradition.

With its 1984 theme "Share the Outdoor Tradition," National Hunting and Fishing (NHF) Day asks hunters and fishermen to share their outdoor experience with non-sportsmen.

By giving non-sportsmen the opportunity to learn about the outdoors and wildlife conservation on NHF Day—Saturday, Sept. 22—hunters and fishermen can help ensure a healthy future for their sports.

There are many ways sportsmen can participate in National Hunting and Fishing Day. Activities can range from holding an "open house" at their local sportsmen's club to joining with other sportsmen's clubs and conservation groups to hold a countywide NHF Day program featuring exhibits and demonstrations at a shopping mall or fairgrounds. Attendance at an NHF Day

program can be a few dozen at an "open house" or thousands at a shopping mall.

Anything hunters and fishermen do on NHF Day to increase public awareness of the role they play in conservation and the importance of conserving America's wildlife and natural resources is worthwhile.

National Hunting and Fishing Day has earned the support of more than 40 of the nation's leading conservation organizations, including the National Wildlife Federation and The Izaak Walton League. Each year, more than 2,000 separate National Hunting and Fishing Day activities are attended by more than 10 million people.

National Hunting and Fishing Day's success in reaching the public each year depends on the support of the nation's hunters and fishermen. Every individual—and every club—that participates in National Hunting and Fishing Day makes a difference.—*Bob Davis, National Shooting Sports Foundation, Inc.*

Department Releases New Film

"The Bridge" is a film that explores the types of lands the Department of Fish, Wildlife and Parks manages. Department land is characterized as a "bridge" providing access to our own history and the land upon which that history unfolded.

During the past few decades, it has become increasingly difficult for an individual to feel the presence of the two most powerful environmental forces in his life: time and space. These forces shape one's experience and character. But the passing of time and a lack of recognition for the value of history are creating a wider and wider gulf between present and past. But curiously, as these things become more and more inaccessible, their appeal becomes stronger.

In 30 minutes, the viewer has the opportunity to imagine what life may have been like at the site of the Madison Buffalo Jump, the Missouri Headwaters State Park, and the bustling mining town of Bannack. The viewer's knowledge of waterfowl areas, fishing access sites, and wildlife management areas is expanded, and the importance of preserving these lands for public use is underscored.

The film was produced by Department of Fish, Wildlife and Parks cinematographer Mike Gurnett. "The Bridge" is available free, for conventions, meetings, or classes. To reserve it, contact the department's Film Center at 930 Custer Ave. W; Helena, MT 59620 (406/444-2426). Prints are also available at regional department offices.

BOOK REVIEW

MORE STORIES OF THE OLD DUCK HUNTERS, by Gordon MacQuarrie, compiled and edited by Zack Taylor; Willow Creek Press, 801 Oregon St., Oshkosh, WI 54901; 198 pages, $15 (plus $1 for shipping), hard cover.

Two summers ago I sent for a copy of "Stories of the Old Duck Hunters & Other Drivel," by Gordon MacQuarrie, an outdoor writer who died in 1956. At the time, I had only the vaguest notion of who Gordon MacQuarrie was, but I figured that since the stories were about duck hunting, I couldn't go too far wrong for the price of a paperback book. It turned out to be sort of like making a routine trip to the sport shop only to discover that as the one millionth customer you've won a Browning Superposed shotgun.

I admit that part of my fascination stemmed from the fact that MacQuarrie was born in Superior, Wis., not too far from my hometown, and that his stories were set in northwestern Wisconsin in places with names like Brule, Namakagon, St. Croix, and Eau Claire Lakes. Revisiting this region through MacQuarrie's eyes was a nostalgic odyssey through my boyhood hunting and fishing memories.

But beyond this, MacQuarrie was a truly gifted writer whose story-telling abilities transcend time and place; hunters and fishermen anywhere, regardless of age, should find them appealing. Outdoor editor for the Milwaukee Journal for 20 years, MacQuarrie was also a frequent contributor to the national outdoor magazines, where his yarns about Mr. President and the Old Duck Hunters' Association were widely read in the 1930s and 1940s. Maybe I'm old fashioned, but these stories seem to hark back to a time when hunting and fishing were somehow simpler, and the human values they represent more clearly defined.

Because I liked the first book so well (which is still available at the address above for $7.95), I was delighted to see Willow Creek Press publish a sequel. "More Stories of the Old Duck Hunters" is just what it says—18 more of MacQuarrie's great hunting and fishing stories about northwestern Wisconsin, ducks, trout, ruffed grouse, Mr. President, and assorted salty backwoods characters.

There may be even more good news. According to Zack Taylor's introduction in "More Stories...," "there are twenty stories as yet unpublished...if this issue meets with approval, it is our plan to publish those...."

I, for one, can hardly wait.—*Dave Books*

CONTRIBUTORS

• **Heidi Bailey Youmans**' article, "Montana Muleys," begins: "The mule deer typifies Montana's rich wildlife heritage." She goes on to prove it. The muley lives just about everywhere in the state. It lives in a wide variety of habitats, ranging from mountain top to prairie badlands. And, it is the state's most popular and sought-after big game animal; the 1983 harvest totaled nearly 100,000 mule deer. Youmans, a fish and wildlife biologist for the department in Forsyth, has worked on big game research in the upper Stillwater Valley and has conducted wildlife inventories and population assessments in southeastern Montana. Her responsibilities in Forsyth include coordinating deer management in Region 7 (Miles City). Her article begins on page 2.

• Gather 'round the table and pull your eyeshade down low. It's time for a hand or two of "Elk Poker." Maybe you are acquainted with some of the players: Mother Nature, Father Time, Mr. Bull Elk—and the very important Lady Luck. There are ways to increase your odds—the chance that you might bring home some "steaks" from the game. Turn to **Bob Jensen**'s article on page 6. Jensen was appointed to the Montana Fish and Game Commission in 1983; he is sheriff of McCone County.

• The illustrator for Bob Jensen's article is **Diane Nugent,** Butte. Nugent worked as a commercial artist and fashion illustrator for 12 years. She is currently working as a free-lance commercial artist and has entered shows with her watercolors, pen and inks, and combination pressed flowers and watercolors. Her work is available through the Robin's Nest and Arts Chateau, Butte; Copper Village, Anaconda; and the Tatem House, Helena.

• The Department of Fish, Wildlife and Parks is responsible for managing the state's resident wildlife. It's pretty difficult to do this without specific knowledge about the various species. Some of the knowledge comes from scientific field studies; other information comes from sportsmen. To gather information from sportsmen, the department spends much time "Asking Questions and Finding Answers" through telephone and mail questionnaires. For a look at how it's done, turn to **John Cada's** article on page 8. Cada is the research biologist supervisor at the department's Wildlife Division Research Laboratory in Bozeman.

• **Dan Coughlin,** Helena, illustrated John Cada's article. A native Montanan raised in the ranching community of Helmville, Coughlin's favorite subjects are animals of the Northwest. He works primarily in oil, but enjoys experimenting with pen and ink, acrylics, and watercolor. He has received Merit Awards at the past two Electrum Festivals in Helena. His work is available at the Burl Jones Gallery in Livingston and at Helena's Montana Gallery & Book Shoppe. He teaches third grade at Smith School.

• The Blackleaf Wildlife Management area comprises 9,100 acres of diverse wildlife habitat in the foothills along the Rocky Mountain Front. The area offers streams, marshes, timbered slopes, rocky outcrops, rolling foothills, prairie, and wetlands—something for many kinds of wildlife, and something for sportsmen and non-sportsmen alike. Turn to **Gary Olson's** article on page 15; it's another in the *Montana Outdoors* series on department lands. Olson is a fish and wildlife biologist for the department, working at Conrad.

• It's a long way from South Carolina to Montana. But the lure of Montana and the promise of "all manner of things green and flowering"—to say nothing of hungry trout—were enough to entice **Jon Wongrey** and his son Scooter to the Treasure State. The visit evolved into a treasure-filled trip: dainty streams, sun-washed rocks, raw ridges, and high mountain trout pools. Turn to "Montana Remembered" on page 18. Wongrey is a free-lance writer living in Sumter, S.C. He was outdoors editor for South Carolina's largest paper and has received numerous awards for his work from the South Carolina Wildlife Federation, Southeastern Press Association, and others.

• Illustration for "Montana Remembered" was prepared especially for this issue by Helena artist **Deby Driessen.** Driessen has studied art at Carroll College and plans to continue doing so this fall. She has designed logos and other publicity material for several Helena businesses; one of her designs appeared on balloons at the San Francisco Democratic convention. Her primary artistic interest is animals.

• Nine million years ago, Montana looked much as it does today. Something present then is still present today: a large, stately bird. This bird with the long neck nested and fed in and around the marshes; its resonant call echoed in the spring, and its dancing signaled the beginning of the mating season. It still does. "Nine Million Years and Still Flying High" describes the sandhill crane. Turn to the article by **Tom Butts** on page 20. Butts is a department fish and wildlife biologist in Roundup.

• **Chris Eby** opens her article with three "case histories" taken from actual Montana hunting accident reports. All three accidents occurred while the victims were hunting. All involved firearms. "But were they really accidents...caused by unavoidable circumstances?" she asks. For some sobering, thought-provoking answers, turn to "Hunter Safety: Serious Business" on page 24. Eby is the hunter education program manager in the Conservation Education Division.

• Getting ready for what he *thought* was a routine fisheries survey on the Missouri River from Holter Dam to the Smith River didn't prepare **Rod Berg** for what he found: "Trout Heaven." The river here is marked by clean, cold, and highly productive water. This 61½-mile stretch is also significant because it is one of the last relatively unaltered and free-flowing sections of the entire Missouri. Berg is a fish and wildlife biologist in Missoula; his present assignment is supervisor of fishery studies on the lower Clark Fork River from Milltown Dam to the Flathead River. Turn to his article on page 27.

• Special thanks to **Elmer Sprunger** for the front cover painting of mule deer, done especially for this issue. Born in the Flathead, Sprunger works from his studio (P.O. Box 145; Bigfork, MT 59911). Those interested in seeing his work can do so there, or at Flathead Lake Galleries, Bigfork, or the Crow's Nest, Polson. He believes that preserving the environment is of utmost importance, and that wildlife painting is an expression of concern for the outdoors. He has had several one-man shows, and his work is part of the "Leanin' Tree" series of gift and greeting cards. He also does political cartoons for the Bigfork Eagle.

• Special thanks to the following photographers: **Paul Dix,** Livingston; **Michael Drew,** Lethbridge, Alberta; **Harry Engels,** Helena; **Alan Nelson** and **Conrad Rowe,** Great Falls; **Keith Szafranski,** Livingston; and to the following photographers who work for the Department of Fish, Wildlife and Parks: **Mike Aderhold** and **Louis M. Kis,** Kalispell; and **Jim Posewitz,** Helena.

Blackleaf Wildlife Management Area (photo: GARY OLSON)

Department Lands:

Blackleaf Wildlife Management Area

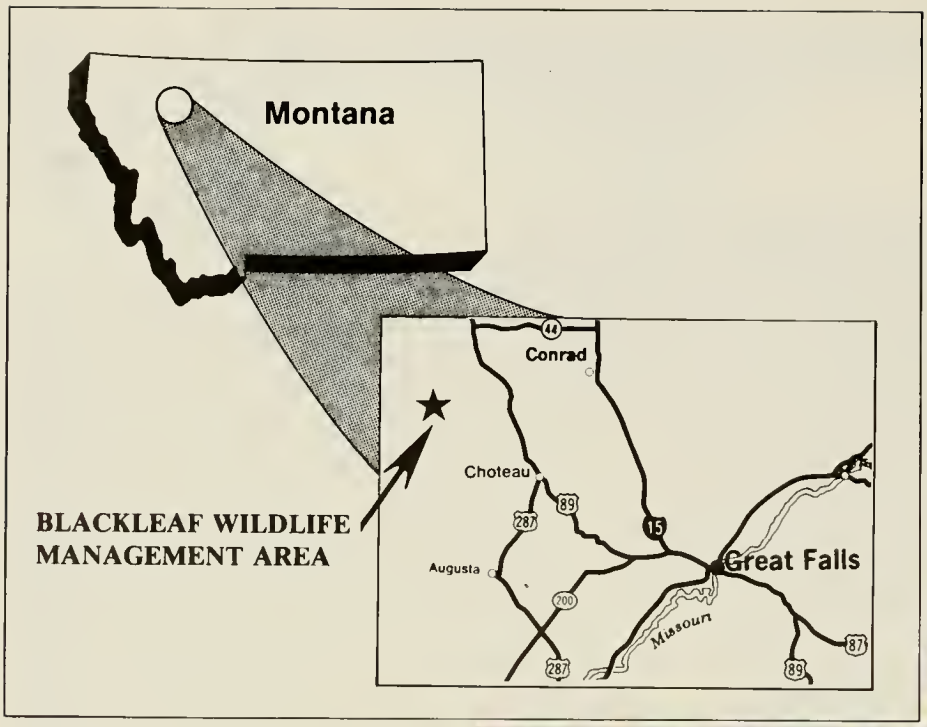
by Gary Olson

The 9,100-acre Blackleaf Wildlife Management Area, acquired in the 1970s, lies in the foothills along the Rocky Mountain Front roughly 20 miles northwest of Choteau. Great Falls is an hour and a half by car to the southeast.

Several streams drain the area from west to east, including Blackleaf Creek, after which the area is named. Terrain varies from wet meadows and marshes to timbered slopes and rocky outcrops. The highest point, along Volcano Reef, is 6,700 feet above sea level; the wet meadows and swamps are mostly at the 4,000-foot mark. The combination of alpine topography, rolling foothills, prairie, and wetlands provides the diversity of habitats and edges essential for many wildlife species.

From the summit of Antelope Butte, a prominent hill in the vicinity, one can still see remnants of the Old North Trail, an ancient travel route used by wandering Indian tribes for centuries. Only a slight depression on the prairie remains of this once-busy thoroughfare. The Blackfeet and Flathead Indians are said to have fought a fierce battle behind Antelope Butte in 1859. The site is marked by piles of stones laid in rows approximately 100 yards long; the significance of this peculiar arrangement is not known. Tipi rings still dot the hilltops, but unfortunately, little is known about the human history of the area prior to the white man's arrival.

The first permanent white settlers arrived at a tributary of Blackleaf Creek in the early 1870s; by 1890, cattle and sheep ranching was firmly established. After the unreserved public lands were opened to settlement in the early 1900s, it was common to see a cabin on every section, or at least several in every township, where hardy souls were trying to "prove up" on their homesteads. According to old-timers, it was during this period that the Blackleaf Literary Society was established. Frequent



social gatherings were a way of life in those days, since there were no phones or daily mail service. People met at a central location, normally the schoolhouse, to discuss local and national events. As many as 35 people attended the meetings of the Blackleaf Literary Society; it is said that the topics of discussion, while not always literary, were always lively!

Wildlife has always been an important part of the area's history; elk, deer, antelope, bears, bighorn sheep, and mountain goats all inhabit the Rocky Mountain Front. Wildlife was scarce in this region around the turn of the century, due to a combination of subsistence hunting and heavy competition for forage from domestic livestock. Fortunately, public attitudes began to change and the stage was set for the beginning of a recovery. Restrictions on hunting and protection of key areas of big game habitat afforded the herds an opportunity to rebuild. The Department of Fish and Game acquired the Sun River Wildlife Management Area in 1947; in 1964, with passage of the Wilderness Act, the Bob Marshall Wilderness became the crown jewel of the wilderness system.

In 1972, the Scapegoat Wilderness was added to the south of the Bob Marshall, and in 1978 the Great Bear Wilderness was added to the north and west. The Department of Fish, Wildlife and Parks acquired the Ear Mountain Wildlife Management Area and the Blackleaf in the 1970s. Today, wildlife populations along the Front are many times what they were in the early 1900s, providing vastly improved recreational opportunities for the public.

One of the species of primary interest along the Front is the grizzly bear. Although historical grizzly population numbers are not available, the big bears undoubtedly declined with the advent of sheep grazing in the foothills. Recent studies have shown the grizzly bear population along the Front to be stable. Areas like the Blackleaf are especially important in early spring,

LOUIS M. KIS

when bears first emerge from their dens. Food is not yet available in the high country, so the bruins amble downslope to the areas that green up early, such as wet meadows, marshes, and creek bottoms. In the past few years, 17 different grizzlies have been identified in the general area of the Blackleaf Wildlife Management Area. The diversity of land forms and vegetation makes it an especially appealing place for bears to congregate.

Although green plants and insects make up the bulk of the bears' spring diet, carrion is also relished. Most ranchers have "bone yards" where dead livestock are dumped; these areas attract bears, but don't pose much of a problem if they are located far enough away from the ranching operation. In fact, some operators claim the bears do them a favor by cleaning up dead animals.

The Blackleaf is also important to elk and mule deer during winter and early spring. Elk generally move onto the winter range from mid-November through December. When the snow recedes, the elk start migrating back to the wilderness high country. Mule deer use the Blackleaf extensively during winter; the scattered mosaic of timber and open meadows provides security cover and bedding grounds near food supplies.

In an unexpected turn of events, significant amounts of natural gas were discovered on the Blackleaf during wildcat exploration in 1980 and 1981 (the department did not acquire mineral rights with the property, and these rights had been leased prior to purchase). One well is currently producing and another is still undeveloped.

Access to a drilling site requires a suitable road, and in rugged terrain this becomes a real problem, especially on a wildlife management area. One such site was accessible only by a south-facing slope and ridge, which were also important to elk and mule deer in early spring. South slopes green up earlier than adjacent areas which do not get as much direct sunlight, and act as magnets to animals hungry for green plants after a long winter of dry forage.

A road was constructed to the site across the south-facing slope and was used during the drilling period. Through negotiations with the company, the road was reclaimed after drilling was completed. A large backhoe pulled dirt and rock back to the original grade and the site was seeded with a variety of forbs and grasses. An alternate location was selected for the permanent access road, one which would have far less impact on wildlife, soil, and water quality. Today, the reseeded road is merely a green smear across the hillside, a reminder that cooperation and careful planning is precious to sound resource management.

The Blackleaf Wildlife Management Area is currently open to the public from May 15 to the end of the general big game season. Access roads and parking areas have been provided to ensure maximum recreational opportunity. Public use during winter and spring is restricted, so that wintering deer and elk will have freedom of movement throughout the area. Public use is heaviest during the big game season, but early fall along the Front seems to attract larger numbers of recreationists annually. Multi-colored willow and aspen stands dot the many drainages that meander from the foothills toward ungrazed prairie to the east. The striking contrast of creek bottoms and sun-cured prairie against a backdrop of pine-mantled foothills and somber rock cliffs forms an impression not easily forgotten. The Blackleaf Wildlife Management Area is truly a wild, unique piece of Montana. ■

Asking Questions

continued from page 10

to the department and the public by late May or early June. They provide not only an estimate of the preceding year's harvest by species and license type, but also trend information based on previous years' harvests.

The harvest summaries are most valuable for management at the hunting district level. For example, in a typical deer hunting district, the harvest information includes number of permits issued, hunters afield, total harvest, age and sex of harvest, and days afield for each license type (Table 1, page 10).

Statewide summaries are used primarily to compare the contributions of each species to hunting-related activities in Montana. For example, considering that 139,467 deer, 17,022 elk, and 26,438 antelope were harvested in Montana in 1983, one can better appreciate the contribution these three species make to sporting residents and nonresidents each year (Table 2, page 10). In addition, hunters annually harvest over 400,000 other big and small game animals. Resident and nonresident hunters together spend 2.5 million days afield.

One of the greatest values of the annual surveys is trend information. The department has been collecting harvest data for Montana since the early 1940s, so hunting and harvest trends for most species can be compared over about 40 years. The trends for elk, deer, and antelope parallel trends for most other big game species in Montana (Figure 1). When comparing five-year averages, harvest trends for elk and antelope have been high since 1955. Elk and antelope harvests have been relatively stable during this period, but deer harvests have gone in cycles. The highest deer harvests occurred in Montana during the early 1960s; if the recent trend continues, equally high deer harvests could occur during the next few years. Since harvest levels are regulated by various management strategies based on population levels, harvest trends tend to follow population trends.

The Future

The future often can be predicted by the trends of the past. Unless limited in some way, trends in hunter numbers tend to reflect demand, and demand is at least partially a function of animal availability. Since 1955, deer and elk hunters have been increasing at a rate of about 1,500 hunters per year. If that trend continues, as is likely, by 1990 there will be an additional 10,500 people hunting deer and elk in Montana. Since antelope hunters are limited by permits, their numbers tend to parallel harvests; however, increasing demand for antelope hunting is occurring at similar rates. These increases reflect increases in hunting demand for all species in Montana. This means that the department's job of maintaining the resource and providing adequate recreational opportunity for resident and nonresident sportsmen will become even more challenging in the future.

How will this challenge be met? Our success with solving present and future wildlife-related problems depends largely on the ability to continue to learn about not only the biological needs of the resource but also the needs of the users. The need for more information ensures that we will continue to seek answers by asking questions—a lot of questions. ■

Montana Remembered

That summer, everything withered and died and would not again blossom or flower until the following spring. That was the summer my son and I left our South Carolina home to journey west to Montana.

Montana's torrential snows and huffing winds were gone, and all manner of things were green and flowering, soft to the eye, with fragrances pleasant to inhale. That's how things were in that summer so long ago, when we arrived in Darby to ascend the Selway-Bitterroot Wilderness Area's mountains and to fish those wild mountain streams and lakes.

So come with me for as long as it takes to tell the story.

After a day's climb and a night's sleep, we awoke rested. The grass, moistened with dew, was as young velvet; the leaves and flowers were clean and without blemish. There was no sign of wind, and the eternal snows in the refuge of high mountain crevices were bright and against the youthful sun as it marched in to proclaim day.

The dainty stream before us throbbed to its own unbroken cadence, for it had no drum major to orchestrate its melody as it tumbled from the high mountains.

Scooter, my son, had gone over to the stream to collect water for cooking. He saw trout rising to a niggardly fly hatch, and the water's surface was pockmarked with the dimples of trout sipping insects. The trout were small, very small, and we did not bother to rig up and fish.

I remember climbing onto a large sun-washed rock where I could look yet higher, up to the uttermost heights, where humpbacked ridges, raw and naked, were cousin to the sky.

Our early morning fire had now been reduced to glowing embers, and we made a breakfast of oatmeal mixed with fresh wild huckleberries, sugar, and canned milk. When we finished we made ourselves a cup of tea, walked to the stream, and in leisure and silence drank the hot liquid.

The day's hike went uninterrupted and by evening we had reached another stream, this one larger than the first. It had three deep pools where trout rested and feasted.

Our camp was a meadow of emerald, a mead of soft green padding. Beyond where the pasture met with water lay the quietness of one of the high mountain trout pools. Even then we knew that trout were sipping insects, but the sun was marching quickly from the mountains.

We slept through the early grey morning, until the direct rays of the sun brushed

by Jon Wongrey
illustrated by Deby Driessen

our eyelids. Then we went about the business of getting a fire and a breakfast going, for the mountain air was cold and our bodies hungered for food. Minutes later the flames licked the sharp, clean air, and then we settled down to hot tea and another feast of oatmeal with sugar and fresh berries.

Dishes done and put away, we rigged up and went to one of the pools. Scooter made his first cast. It was a quiet, articulate presentation in a perfectly created pool. The leader went taut as a trout raced away with the ancient and battered royal Wulff. He kept the fly rod high, bringing the trout from its deep-water asylum across the stream's tugging currents and into the shallows. It was a beautiful cutthroat. Three, maybe four,such fish would make a bountiful lunch. Scooter took another before I took my first, and what a wild ride it was—first to the left, and then to the right the fish ran. The fish was not large, but neither was it small. An average cutthroat, I suppose. Scooter caught the fourth trout, and we retired to a pan of fish sputtering in the hot grease and turning brown, their tails curling up crisp. To the side of the fire, a pot of grits, a southern tradition, bubbled. The smell of the fish and grits mixed well with the alpine air.

Even now when I think about those mountains and their grandness, I realize I have never been acquainted with anything to compare them to. In some ways, they are the final trial of strength. We tended to our camp chores and then went back to fishing. Our success continued through the afternoon, as we enticed trout with a realm of flies. There seemed to be no end to our catching. Those we didn't need for dinner, we turned back. Between adventuring with new and old flies, we rested on the grass carpet, drawing strength from these intermissions.

The day that had begun so bright and alive had grown ancient and worn. The first shadows of night began creeping down the mountain wall, greying the rocks and dimming the snows. Cold reclaimed the land, and we stayed close by the fire as the fish fried brown. We were ravenous, not having eaten since lunch, and we took quick bites at the first of the trout to come fiery hot from the pan.

Darkness came upon us. With our stomachs full of fish and hot tea, we listened to the night sounds and watched the moonlight stream through the mountains. Below, in the faraway valley, a mountain village and its people slept.

In the morning, we found where the stream narrowed and, crossing it, we plunged deeper into the wilderness and higher into the mountains. The deep woods receded,

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Nine Million Years And Still Flying High

by Tom Butts

KEITH SZAFRANSKI

Sandhill cranes migrate through Montana on their way to Arctic nesting grounds in Alaska and Canada. Greater sandhills, once rare throughout the Rocky Mountains, now breed in Montana, and their numbers are increasing every year. The down-covered young cranes, called colts, leave the nest a few hours after hatching.

GARY D. HOLMES

Nine million years ago, Montana looked much like it does today. The major mountain systems had risen, and the grasses on the prairies waved from horizon to horizon in warm winds. This was the middle of the Pliocene Epoch, millions of years before the glaciations of the Pleistocene. The climate was warmer and drier, and winters were without snow. Frequent ashfalls from volcanic activity in the Cascade Mountains to the west blanketed the land.

Most of the mammals which live in Montana today evolved much more recently, during the last two million years of the Pleistocene. However, the prairies of Montana nine million years ago probably would have reminded one of parts of today's African veldt. Large herds of many species of true antelopes roamed the grasslands, as did the predecessors of the modern pronghorn antelope (which is not a true antelope). Wild horses, smaller and swifter than modern horses, were common. Hornless rhinoceroses, camels (looking somewhat like modern south American llamas), mammoths, and saber-toothed tigers roamed Montana's prairies and mountain valleys.

Large marshes were common throughout the mountain basins of western Montana. Among all the prehistoric and long-vanished species of the period, a large, stately bird nested and fed in and around these marshes. The loud, resonant call undoubtedly echoed throughout the valleys in the spring, and the dancing of mating pairs may well have caught the attention of animals now long extinct.

Remarkably, this bird—the sandhill crane—is essentially unchanged in nine million years, and it still lives and breeds in Montana.

Cranes have an ancient history. The first cranes lived 40 million to 60 million years ago and may have been contemporaries of dinosaurs. Today, there are only 15 species of cranes in the world, and seven of these are endangered.

Rare whooping cranes and three subspecies of sandhill cranes pass through Montana. The lesser and Canadian

HARRY ENGELS

sandhills migrate through eastern Montana on their passage between Arctic and sub-Arctic nesting grounds in Alaska and Canada, and their wintering grounds in Texas, New Mexico, and northern Mexico. Greater sandhills are the only cranes that nest in Montana. These cranes are part of the group biologists call the "Rocky Mountain Population" (RMP).

Greater sandhills are large, graceful birds. Adults are approximately 48 inches long and have a wingspan of six to seven feet; females are somewhat smaller than males. Both sexes have long legs, long necks, and sharp daggerlike bills. Their color is slate-blue, with a brownish tinge. A prominent feature common to most cranes is a naked patch of dark red skin extending from the bill to the crown of the head behind the eye. Juveniles lack the red crest and are colored sandy brown until a year old.

People often confuse great blue herons and cranes. Herons roost and fly holding their necks in an "S" shape, while cranes hold their necks straight while standing and outstretched while flying. Herons nest in trees in large, bulky nests made of sticks. They generally nest in large concentrations called heronries. Cranes nest on the ground in pairs.

Greater sandhills were once abundant throughout the Great Basin states, but they gradually disappeared from much of their range due to drainage of wetlands, shooting for food and sport, settlement, and disturbance by humans. Crane hunting was outlawed in the United States in 1916 by the Migratory Bird Treaty, but numbers continued to decline. By 1940, the RMP consisted of about 250 birds. In "The Sandhill Cranes," Lawrence Walkinshaw wrote that breeding sandhills disappeared from Montana shortly after white man settled here; as late as 1949, there were still no cranes breeding in the state.

Greater sandhills now breed in several locations in Montana, and their numbers are increasing annually. The primary breeding areas are southwestern Montana in the Centennial, Big Hole, and Madison valleys. Some nesting also occurs along the East Slope of the Rocky Mountains and in the Crazy Mountains. The RMP, whose breeding grounds include Montana, Idaho, Utah, Wyoming, and Colorado, comprises about 16,000 birds. These cranes migrate from their breeding grounds southward in September, staging in Colorado and wintering in New Mexico, southeastern Arizona, and northern Mexico.

Sandhills arrive on their breeding grounds in Montana in April and begin at once to establish breeding territories. When they are 3 or 4 years old, cranes form pair bonds while they are on the wintering grounds. Cranes mate for life, but if one of the pair is lost, the other will re-mate.

Breeding territories are located in large, secluded marshy areas. Nesting habitat requirements include water; nearby feeding areas such as wet meadows, grain fields, or open woodlands; and privacy. Each pair has a large nesting territory, often more than 100 acres. The cranes often occupy these territories two to four weeks before they begin building nests.

Courtship rituals peak during this pre-breeding period. Both males and females perform elaborate dances—head-dipping, wing-flapping, running, and leaping into the air.

sandhill crane photo: HARRY ENGELS

These rituals are apparently necessary to synchronize breeding readiness and maintain pair bonds. They also practice unison calling, in which both cranes call together in definite, formalized patterns.

In May, cranes build nests on small islands or in water from a few inches to several feet deep. Their nests are made of dried tules, reeds, and marsh grasses. Their nests are large, often five feet wide and a foot above the water, and often near the center of the marsh.

They usually lay two, but occasionally one or three, eggs. The female begins setting as soon as the first egg is laid, and others are laid at one- to two-day intervals. Both cranes incubate the eggs; the female takes the night shift, while the male incubates during the day. If the eggs are destroyed during the first half of incubation, the pair will probably re-nest. Incubation lasts 28 to 32 days.

The eggs do not hatch at the same time. The colts, as the young cranes are called, are covered with down and are able to leave the nest a few hours after hatching. They are quite aggressive, and occasionally the older colt will kill the younger one. Because of this, crane parents often brood the colts separately.

The young cranes almost exclusively eat animal foods found in the marsh, such as frogs, crayfish, snails, worms, and insects. They grow rapidly.

The young cranes begin to fly at two to three months, and then join their parents in feeding in nearby fields. Adult cranes eat a variety of foods, including grain, roots, tender herbage, mice, small birds, insects, reptiles, and just about anything they can catch.

In September and October, crane families begin to band together for the southern migration. Their migration flights are often at great height, occasionally two or three miles above the ground.

No hunting of greater sandhill cranes is allowed in Montana. Permits to hunt lesser sandhills migrating through eastern Montana are available through some Department of Fish, Wildlife and Parks regional headquarters.

Cranes are wary, often feeding in open fields, so approach is difficult. Generally, only 20 to 30 lesser sandhills are harvested in Montana annually. Hunters take most of these over goose decoys or by sneaking up on them while they are resting at stock ponds. Cranes make fine table fare.

Sandhill crane populations can tolerate limited hunting. Lesser sandhills number several hundred thousand and greater sandhill populations both in the Rocky Mountains and in the Midwest are making strong recoveries.

However, the crane's position is possibly precarious. Migrating cranes stop at traditional staging areas in large concentrations, and winter in localized areas. If these areas are not protected vigorously or if the wetlands necessary for breeding are not protected, sandhills could rapidly join their cousins, the whooping cranes, as a historical anachronism. Sandhills have survived for millions of years, living through four glaciations. Their future depends on their ability to adapt to man and his unending craving for space. ■

READERS RESPOND

More Than A Slap On The Wrist

I enjoyed reading "Montana Sting" in the May/June 1984 issue more than any other article you have printed. Great stuff! I have long believed that such illegal activities were common all over the country and I sure do like to hear about some of them getting caught. It's too bad you didn't say how much the fines and sentences were for those convicted. I would consider it terrible if all they got was a slap on the wrist.

I believe more effort should be put into enforcement and that more attention should be paid to publication in the daily and weekly papers of fines and other punishment.—*Frank Trask Jr.; Deer Lodge, Mont.*

• *The following letter answers Mr. Trask's questions about fines and sentences.*—Ed.

"I thought your readers might be interested in the outcome of the court action on the subjects mentioned in your 'Montana Sting' story. The following were sentenced in Federal District Court: Lucian Ball—three years, $5,000 fine. Jerry Marjerrison—five years, $5,000 fine, ordered to pay $2,790 restitution, forfeited one 4X4 Blazer, rifles, etc. Dale Leonard—10 years, $20,000 fine, ordered to pay $4,000 restitution, also charged with nine Colorado felonies. Stephen McClung—10 years, $20,000 fine, ordered to pay $7,700 restitution, forfeited two vehicles, one snowmobile, rifle, cameras. Cindy McClung—one year, $5,000 fine. Kevin Fruit—$2,000 fine, 500-hour community service, forfeited one vehicle. Walter Mullany [a Colorado resident not named in the article]—$1,000 fine, two years probation.

"Based on being convicted of federal felonies, none of the above will ever be able to possess firearms. Without the enthusiastic cooperation of Montana Department of Fish, Wildlife and Parks Director Jim Flynn and his wardens, the case would not have reached a successful conclusion."—*Joel B. Scrafford, senior resident agent, law enforcement, U.S. Fish and Wildlife Service; Billings, Mont.*

Keep Montana Alive

After visiting numerous times during my college years, I finally moved to your great state. Only to have to move back due to economic reasons. I now believe I've been shortchanged by not being born and raised in Montana.

Even though I'm stuck in California for now, someday soon I'll return—this time to make a stay of it. Until then, your magazine keeps Montana alive in me. *Montana Outdoors,* keep up the good work; we appreciate it every month when you arrive.—*Frank Jaworski; Stockton, Calif.*

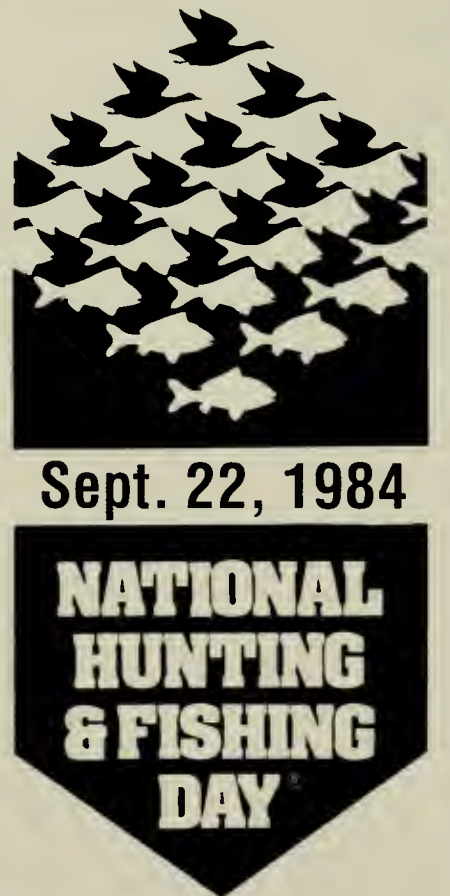
Butterfly ID From "Down Under"

My family and I were delighted to receive the Jan./Feb. 1984 issue with its beautiful photographs of many of the features of Montana we had come to love during 10 months in Missoula. (I was visiting scholar with the Wilderness Management Laboratory, USDA Forest Service, for part of 1981 and 1982.) We were fortunate that my activities provided much opportunity to view Rocky Mountain wildlife and scenery.

Since returning to Australia where I am a lecturer in geography at James Cook University, friends have sent us a gift subscription to *Montana Outdoors,* and we look forward to each issue. The birds, mammals, and scenery evoke memories of the marvelous experience we enjoyed.

One point you might like to clear up with your readers: The Jan./Feb. back cover photograph by Steve Wirt is said to be of a "moth." Not so! Although I am not too familiar with North American species, the creature in question is certainly a butterfly of the family Lycaenidae. I would guess it is *Lycaeide argyrognomon* (the northern blue), but no doubt one of your local experts could put a correct name to it. I am a keen butterfly enthusiast, and here in the tropics we have very many species.—*Peter Valentine; Townsville; Queensland, Australia*

• *A reader, who is also a biologist with our department, pointed out our error in the letters section of the May/June issue (which you no doubt have received by now). Your conclusions match: that the moth is a butterfly, of a family known as the "Blues."*—Ed.



Kootenai Falls Revisited

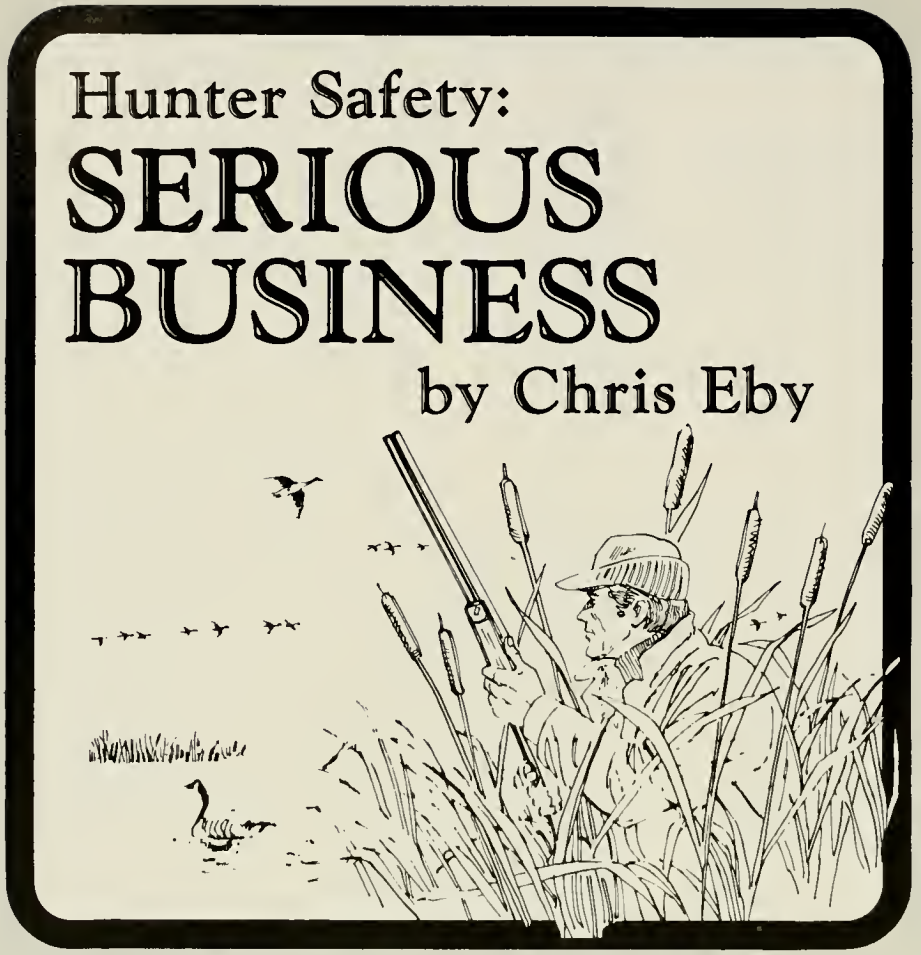
I was looking through some old copies of *Montana Outdoors,* and I have a question. In the Sept./Oct. 1979 issue, there was an article on a proposed dam at Kootenai Falls ("The Timelessness of Thunder Dancing," by Patrick Graham). Both the article and photography were beautiful, and I was wondering if this dam was ever built.

I hope not. I've never been to Montana, but when I get there, it's sights like Kootenai Falls I want to see!—*John Kuster; Pitcairn, Penn.*

• *The proposal to construct a dam at Kootenai Falls was taken before the Federal Energy Regulatory Commission. Following over a year of hearings on the proposed project, the administrative law judge recommended to the commission that the dam not be built. Issues raised in the article—including the question of need for the electricity, the value of the fish and wildlife resources, and the cultural significance of the falls to the Kootenai Indians—were all issues cited in the decision. The state of Monana, Kootenai Indians, and the staff for the Federal Energy Regulatory Commission had all recommended against construction of the project. The developers have appealed the decision and it is unkonwn when the commission will make its final decision.*—Ed.

Hunter Safety: SERIOUS BUSINESS

by Chris Eby



It was a beautiful winter day and Mary Wilson was bird hunting with her husband. Suddenly they heard a shot, and Mary felt something hit her in the side. The high-powered rifle bullet that struck Mary first hit the breech of her shotgun, exploding it into shrapnel and causing even more injury.

Bill Adams and Jim Birely were deer hunting late one afternoon in November. After stopping their truck to check out a ridge, Bill lifted a 300 Savage rifle from the gun rack. A round shot through the right side of the truck, splitting the bullet in half. Part of the bullet struck Jim above his left eye, burrowed around his head between the skin and skull, then exited over his right eye. If the truck's door frame hadn't slowed the bullet and flattened the point, the bullet probably would have entered Birely's skull. As it was, the young man was lucky.

One-half hour into opening day of bird hunting season, Barry Welsh was hunting with two friends. A pheasant flew up between Barry and one of his companions. The friend saw the pheasant and shot, not thinking that he might hit Barry. Barry was not badly hurt, and surgery removed the shot from his right leg.

In the first accident, Mary Wilson was not wearing fluorescent orange because it isn't required while bird hunting. Investigators have not determined the cause of the accident; however, they believe another hunter may have mistaken her for a game animal or coyote. We may never know—because the person responsible for the shooting fled the scene.

In the second accident, that trusty 300 Savage discharged inside the motor vehicle. There were actually two causes: the hunter's failure to control the direction of the muzzle, and carrying a loaded firearm in a vehicle.

Two factors could have contributed to the third accident as well. Barry Welsh wasn't wearing hunter orange (not required during bird season), and his partner failed to identify what was beyond his target before firing. Welsh himself later said he believed the accident occurred because he was not wearing fluorescent orange.

The names of the victims in these accidents have been changed, but all were taken from actual Montana hunting accident report forms. All three accidents occurred while the victims were hunting. All involved firearms. But were they really accidents? Were they caused by unavoidable circumstances, or could they have been prevented? More than likely, all three—in fact *most* hunting accidents—could have been prevented.

If the three most basic firearms safety rules were practiced at all times, there would be fewer (possibly no) such accidents.

(1) TREAT EVERY GUN AS IF IT WERE LOADED. This goes for guns that are loaded *or* unloaded. Each year accidents happen, and someone says, "But I thought it was unloaded." That's no excuse for *ever* pointing a gun at anything you don't intend to shoot.

(2) ALWAYS POINT THE MUZZLE IN A SAFE DIRECTION. This is an easy habit to get into, and one everyone should practice at all times. It's just good sense *never* to point a gun at anyone.

(3) BE SURE OF YOUR TARGET AND BEYOND. Don't ever take a shot unless you're sure you've clearly identified your target and are sure you can see behind it and around it.

The hunting accident picture isn't quite as bleak as the scenes described above make it seem. Fewer than one in 10,000 hunters is ever involved in a hunting accident. Studies show that a person is more likely to be injured in a fall, while bicycling, or through participating in baseball, football, or basketball. More people are injured while taking a bath or shower or while dancing than while hunting. Annually, more people are injured falling from bar stools than from firearms/hunting accidents. So you can see how safe hunting really is.

Part of the reason that hunting accident rates are dropping is because every state and province in North America offers a hunter education course for its young people, first-time hunters, and even adults. Over half of the states and provinces require that young and new hunters complete such a course before they can purchase hunting licenses.

In Montana, over 600 dedicated men and women volunteer their time to teach hunter education. Montana's hunter education program has been operating since 1958. In those 26 years, over 186,000 young people and numerous adults have received this important training. Instructors must spend a minimum of 10 hours teaching students about firearms safety, survival, hunter responsibility and ethics, game identification, wildlife management and conservation, and much more. Many instructors now spend 18 or more hours with their classes in order to cover all of the subjects in more depth. These instructors are the heart of hunter education.

As much as all hunting accidents are tragedies, they are also statistics. Let's take a look at Montana's hunting accident statistics during the past 26 years. Statistics show that in 1958, there were a total of 19 hunting/firearms accidents. Six were fatal, and 13 were not. In 1959, there

were 40 hunting accidents. Eleven of these can be attributed to lack of a fluorescent orange law—the victims were either mistaken for game or were simply out of sight of the shooter.

These latter mishaps are "intentional discharge" accidents. In other words, the shooter was actually firing a gun, intending to shoot an animal. The other category of hunting accidents is "unintentional discharge." These are accidents caused by unloading a firearm, a firearm falling from an insecure rest and discharging, a shooter stumbling and falling causing a firearm to discharge, horseplay with a firearm, or carrying a loaded firearm in a vehicle. Most of Montana's accidents fall under this last category.

The number of hunting accidents fluctuates from year to year; without extensive evaluation, it's difficult to determine the actual causes for these fluctuations. However, some significant drops during specific years are worth noting.

The first Montana hunter orange law was enacted in 1971. Beginning in that year, the chart noticeably declines in the number of people mistaken for game or simply not seen. In some states, there has been as much as a 50% drop in accidents because of mandatory hunter orange requirements. From 1971 on, the number of "intentional discharge" accidents has remained fairly low in Montana.

In 1974, Montana's law was amended to read that 400 square inches of hunter orange material had to be "visible at all times while hunting." This revision of the law also shows up in decreased numbers on the chart. Unfortunately, not everyone in the woods is a hunter, and not all hunters follow the hunter orange law.

Nationwide, as hunting accident statistics are compiled, we see the cause of most hunting/firearms accidents is poor hunter judgment. In other words, the victims were out of sight of the shooter, they were covered by a shooter swinging on game, they were mistaken for game, or they moved into the line of fire—"intentional discharge" accidents.

In Montana, most of our hunting/firearms accidents result from basic safety violations or improper gun handling such as horseplay with a loaded firearm, a firearm discharging while an individual is unloading or loading it, or when the individual encounters obstacles such as fences or slippery or treacherous terrain.

During the past few years in Montana, many firearms accidents have been attributed to carrying loaded firearms in vehicles. While being removed from or placed in a vehicle, the firearm discharges. Sometimes a jarring movement will cause a loaded firearm to go off in a vehicle. In any case, the reason we have so many of these types of accidents in Montana is lack of a law prohibiting loaded firearms in vehicles. It is a game law violation to shoot big game from a vehicle. However, it is *not* against the law to carry a loaded firearm in a vehicle. Common sense and consideration for safety tell us we should *never* get into a vehicle with a loaded firearm, regardless of the law's deficiencies.

Hunters are most likely to be injured while hunting game animals such as deer, elk, or bear, and most accidents seem to occur in Montana between 1 p.m. and 8 p.m. Those between the ages of 12 and 29 run the greatest risk of being involved in such an accident. In nearly one-third of all hunting/firearms accidents, the wounds are self-inflicted. And something most of us don't think about: If you are ever involved in a hunting accident, and if the wound is *not* self-inflicted, it is very likely that the person shooting will be a close friend or relative. Most often, hunting companions are the responsible parties in shooting accidents.

Hunting Accidents Per Year, 1960-1983

Year	Total accidents	Intentional discharge	Unintentional discharge
1960	33	6	27
1961	35	12	23
1962	42	6	36
1963	25	3	22
1964	18	1	17
1965	26	8	18
1966	30	7	23
1967	30	6	24
1968	15	2	13
1969	12	9	3
1970	32	8	24
* **1971**	**14**	**5**	**9**
1972	16	3	13
1973	36	6	30
** **1974**	**25**	**1**	**24**
1975	25	4	21
1976	18	1	17
1977	14	3	11
1978	22	1	21
1979	15	2	13
1980	7	0	7
1981	11	1	10
1982	10	4	6
1983	13	3	10
1984	No reports filed at this time.		

* The first Montana hunter orange law was enacted.

** Hunter orange law amended so that 400 square inches of hunter orange material had to be visible at all times while hunting.

The "shoulder carry" is safe when walking beside or behind someone. Special care must be taken to keep the muzzle pointed upward. Do not use this carry when others are behind you.

The following gun safety rules apply to all of us. We've all heard most of the rules many times before, but it doesn't hurt to be reminded of them—and to be reminded to put them into practice *every* time we use a firearm:

- Treat *every* gun with the respect due a *loaded* gun.
- Point the muzzle in a safe direction.
- Unload the gun before crossing an obstacle such as a fence or difficult terrain.

• Keep the safety on until ready to fire.
• Never try to alter or modify a gun yourself. Leave that to a qualified gunsmith.
• Be sure the barrel is free of obstruction.
• Never point the gun at anything you don't intend to shoot.
• Never drink while hunting or shooting.
• When placing a gun in your vehicle, unload and case it.
• When picking up a gun, check to be sure there is no ammunition in the magazine or chamber.
• Never lean your gun against an insecure rest such as a car or tree.
• Never shoot at a hard, flat surface, or the surface of water.
• In the home, keep firearms and ammunition in locked areas, preferably in separate locations.
• If you are hunting with other people, agree before the hunt on the area each shooter will cover.
• Insist your partners follow all the rules of safe gun handling.
• Know where your hunting partners are at all times.
• Plan your hunt, know your plan, and follow it.
• Be sure of your target and beyond.
• Don't use your scope as a pair of binoculars.
• Don't let your emotions replace good judgment.
• Be visible and be seen—wear hunter orange clothing.
• Don't wear anything that would make you resemble a game animal.
• Never shoot at a sound or movement.

Becoming a safe hunter means following the basic safety rules, but it also involves such things as being familiar with your gun before your hunting trip. It's surprising how many hunters take to the field without knowing how their gun works or what it's capable of. Becoming a good marksman and practicing at a shooting range or gun club *before* hunting season is important.

Remember, too, that some clothing can actually make you look like a game animal. Using a red handkerchief or wearing red while hunting turkeys, or wearing white clothing or a brown coat while big game hunting provides dangerous visual clues to other hunters.

Knowing rules of firearms safety isn't enough. You must follow them and hunt by them. Even though each hunting accident is unique, each is also similar to others. They are all the direct result of someone's mistake.

Hunting in Montana has become a time-honored tradition and has given many people hours of pleasure. Hunting can be a challenging, fun, and rewarding experience, but it is also serious business. ■

The "elbow or side carry" is safe when walking in open terrain. It should not be used when walking through brush because branches can get tangled around the gun and push the barrel downward. Do not use the side carry when others are ahead of you.

When hunting from a pit or blind, lay your unloaded firearm on the ground near the entrance to the pit. When you are in the pit, bring in the unloaded gun. Check your firearm carefully to be sure the muzzle has not become clogged with dirt or snow. Unload the gun before leaving the pit or blind. Lay it on the ground outside before you come out.

When you are alone and must cross a fence, unload your firearm and place it under the fence with the muzzle pointed away from where you are crossing. When hunting with others and you must cross a fence, unload the gun and keep the action open. Have one of your companions hold the gun while you cross. When over the fence, take your gun and your companion's unloaded gun, so that he may cross safely.

TROUT H·E·A·V·E·N

JIM POSEWITZ

I'll never forget an early September evening a few years ago. I waded upstream to a side channel of the Missouri River near the tiny hamlet of Craig, Mont. Only a few days earlier, my employer, then properly called the Montana Department of Fish and Game, had assigned me to survey the fishery on the Missouri from Holter Dam to the Smith River. I was looking over the project area, evaluating various habitats and other characteristics of the river, getting ready to put together a more specific plan for the survey. I didn't really expect to find anything unusual, so I was unprepared for what I was about to see.

As I approached the small side channel, lined with a lush growth of overhanging willows, the unexpected began to unfold. There before me, in the amber glow of the setting sun, trout of all sizes were feeding on the water's surface. It was the sort of scene fishermen's dreams are made of. There were at least a hundred rainbows on the surface, a few leaping into the air, but most just breaking the surface and sticking their noses out for choice tidbits of food. They swirled to within a few yards of where I stood in the water. As far as I could see upstream along the edge of the riffle in the side channel, fish were breaking the water and feeding. I saw the object of their attention, too. It was a hatch of a relatively small, cream-colored mayflies. I was later to learn the small mayflies were well known to local anglers as *Tricos,* a shortened form of their scientific name *Tricorythodes.* What the *Tricos* lacked in size, they more than compensated for in numbers. As a slight breeze blew a cloud of mayflies in my direction, it felt like being in a mild blizzard. Thousands of mayflies were emerging from the water, drying their wings, flying high into the air to mate, and then falling back to the surface of the water where scores of waiting rainbow trout—many in the 15- to 20-inch range—were breaking the water surface in a feeding frenzy. All of this happening within striking distance of a fly line led me to the inevitable conclusion: Absolutely, positively this has to be a dream. I felt compelled to pinch myself to make sure I hadn't passed on to trout heaven. OUCH, that hurt. Just to double check, I kicked a rock, bringing pain to my big toe. I must admit the fact of my fly rod being at home, 70 miles away, probably had something to do with the latter maneuver. I took care of that oversight the next day and embarked on my new assignment with what proved to be unfailing enthusiasm.

Background

The Missouri is the nation's longest river, running 2,475 miles from its origin at Three Forks, Mont., to its confluence with the Mississippi River near St. Louis, Mo. Throughout most of its length, the Missouri has been substantially altered by dams, reservoirs, channel pilings, and flood walls, all compromising the river's natural values. The 61½-mile reach of the Missouri from Holter Dam to

by Rod Berg

the confluence of the Smith River is significant because it is one of the last relatively unaltered and free-flowing stretches of the entire river. The upper 25 miles of this reach, from Holter Dam to Sheep Creek, lies in a picturesque mountain canyon surrounded by the Big Belt Mountains to the south and east and by the east front of the Rocky Mountains to the north and west. Below Sheep Creek, the river abruptly leaves the mountains and meanders through fairly flat prairie and ranch country.

The river between Holter Dam and the confluence of the Smith is characterized by clean, cold, highly productive water. Streambed materials are predominantly gravel and cobble in riffle and run areas. Aquatic insects, such as the *Tricorythodes* mayfly, graze microscopic aquatic plants

Trout population estimates obtained by electrofishing in several areas of the river reveal about 2,000 to 3,000 catchable trout seven inches and larger per mile of stream. These totals include at least 20 to 100 trophy trout 18 inches and larger per mile. Catchable rainbows outnumber catchable browns by about 9-to-1 throughout the river. However, because rainbow trout do not live as long or ultimately grow as large as brown trout in the river, the trophy fishery is composed mostly of browns. Rainbow trout collected in electrofishing surveys averaged just more than a pound and ranged to about 4 pounds, while browns averaged about 2 pounds and ranged to 17 pounds.

Fishery professionals recognize biomass estimates as a good measure of the inherent productivity or carrying

Outstanding scenery and abundant wildlife add to the enjoyment of a Missouri River float trip. Nutrient-rich water contributes to the quality of the trout fishery, which is recognized as one of Montana's finest.

CONRAD ROWE

DAVE BOOKS

called algae, which cover the the gravel and cobbles. The insects, in turn, are a food staple for resident fish. Crannies between the cobbles provide shelter for small forage fish, such as the mottled sculpin, which provide food for fish-eating sport fish such as the brown trout. Deep water, large rocks, overhanging shoreline brush, and the frequent roughness of the water's surface provide security for adult fish.

The Missouri River Fishery

The Missouri River between Holter Dam and the Smith River is an excellent fishery. Twenty species, representing eight families of fishes, are found in this reach. This makes it a relatively uncomplicated fishery compared, for example, with the warm water stretch of the Missouri between Great Falls and Fort Peck Reservoir where 53 species and 14 families of fishes can be found. The Missouri below Holter is predominantly a cold-water, salmonid fishery. Rainbow and brown trout and mountain whitefish are the most common game fishes, and they compose the bulk of the sport fishery. In addition, a few walleye and burbot (ling) are occasionally taken by anglers.

capacity of a body of water. Recent biomass estimates indicate about 3,500 pounds of trout per mile in the Missouri River below Holter Dam, ranking it among the top trout-producing streams in the state (Figure1).

As they are in other trout streams in Montana, mountain whitefish are several times more abundant than trout in the Missouri. Highly regarded by some anglers and disdained by others, whitefish provide a potentially important, although underutilized, resource. They can be taken in winter when trout fishing is often sluggish. Electrofishing estimates reveal about 10,000 to 15,000 catchable whitefish 10 inches and larger per mile in the Missouri below Holter Dam.

Trout are members of a broad family of fishes called Salmonidae. Research has shown most members of this family migrate considerable distances during the spawning season searching for spawning sites. Characteristically, they spawn on clean gravel, in shallow water with moderate current. Rainbows spawn in the spring, while brown trout spawn in the fall.

Research in the Missouri below Holter Dam indicates side channels of the river are vital for trout spawning, egg

incubation, and rearing of juvenile fish. A minimum flow of 4,000 cubic feet per second of water from the dam is required to maintain suitable habitat conditions for these activities in the side channels.

The side channels are necessary for brown trout spawning and incubation of eggs from mid-October through early May, and for rainbow spawning and incubation from February through June. From June through October, side channels and a stable flow of water are necessary for rearing juvenile trout and for production of massive hatches of insects that provide fish food. Adequate flows in the Missouri River have proved to be a year-round requirement.

The popularity of the Missouri for fishing is increasing each year, and it is becoming recognized statewide and nationally as one of Montana's premier trout waters. Its importance is reflected in a statewide fishing pressure survey made during the 1975-76 fishing season which indicated 69,500 "angler days" of fishing on the 61½-mile stretch—an average of 1,130 angler days per mile (an "angler day" is one fisherman using the river during all or part of a day). By comparison, the same survey showed an average of 957 angler days per mile on the Madison River, which is better known nationally.

The high quality of the fishery in the Missouri River is due, in part, to the nutrient-rich water in the drainage. This water allows excellent production of aquatic insects, zooplankton, and forage fish—the food supplies for the fishery. As mentioned previously, the fishery also depends on stable daily flows which maximize food production in the river and assure adequate recruitment of juvenile trout into the adult population.

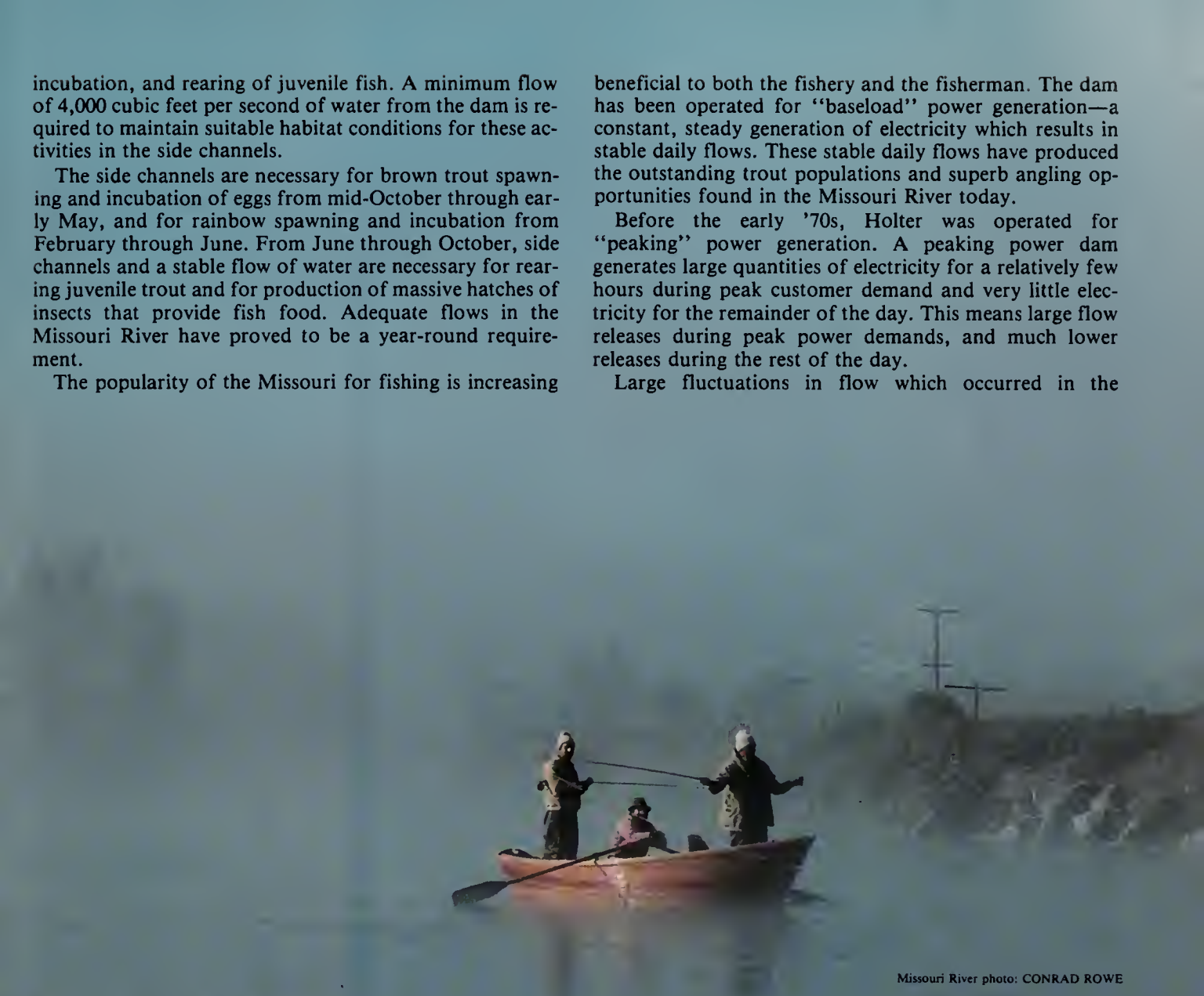
The balance, however, is delicate, since flow in the Missouri River is controlled largely by operation of Holter Dam. Holter has been operated by the Montana Power Co. since the early 1970s in a way that has proved beneficial to both the fishery and the fisherman. The dam has been operated for "baseload" power generation—a constant, steady generation of electricity which results in stable daily flows. These stable daily flows have produced the outstanding trout populations and superb angling opportunities found in the Missouri River today.

Before the early '70s, Holter was operated for "peaking" power generation. A peaking power dam generates large quantities of electricity for a relatively few hours during peak customer demand and very little electricity for the remainder of the day. This means large flow releases during peak power demands, and much lower releases during the rest of the day.

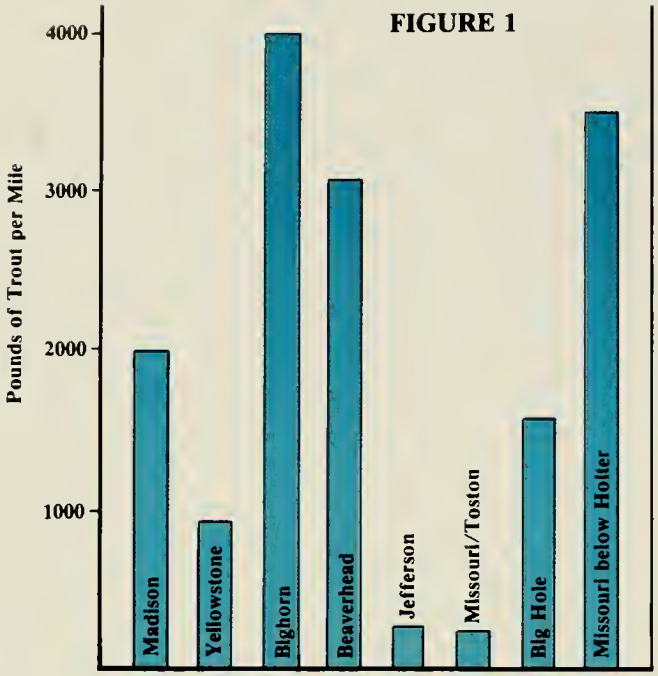
Large fluctuations in flow which occurred in the Missouri River when Holter Dam was operated for peaking power had detrimental effects on fish populations, angling success, and recreational opportunity. Daily flow fluctuations reduced or eliminated vital trout spawning and rearing habits in side channels of the river. Periodic dewatering of shallow riffles hindered production of aquatic insects and forage fish. Catching fish was difficult with fluctuating flow because insect hatches and fish-feeding patterns were disrupted.

Fluctuating flow also resulted in periodic dewatering, drying up, and detaching of periphyton (moss) from the river bed. Moss floating in the river fouled fishing lines, hooks, and lures. Water level fluctuations created safety problems for anglers who waded the river to fish, and navigability problems for fishermen and other recreationists using boats.

In the summer of 1983, Montana Power Co. again considered peaking generation at Holter Dam, but after some testing decided not to implement this option in the near future. Fishermen and recreationists owe a debt of gratitude to the company for converting Holter Dam to baseload power generation and for continuing to operate



Missouri River photo: CONRAD ROWE



in this manner. This modification and continued stewardship by the power company have helped to create one of the nation's finest blue ribbon trout waters. With fishing use continuing to increase and already extensive on other blue ribbon trout waters in Montana such as the Madison, Yellowstone, Bighorn, and Beaverhead rivers, it becomes more imperative each year to maintain stable flows in the Missouri so it can continue to provide its exceptional fishing and recreational values.

Access to the Missouri River between Holter Dam and the Smith River is very good. There are several public access areas along the upper half of the river. Old U.S. Highway 91, now designated a recreation road, parallels lengthy sections of the river and also provides easy access. River flow is always adequate for floating, and many recreationists take advantage of this opportunity. Outstanding scenery and fishing only add to the enjoyment of a float trip.

An added attraction is abundant wildlife throughout this area. A fishing experience can be immeasurably enhanced by a close-up encounter with a pair of mallards or the overhead music from a flight of geese. Mallards, mergansers, Canada geese, and teal nest along the river on islands, backwater areas, and sloughs, and some even spend the winter in ice-free areas along the river. During spring migration, the river is often an important resting area for thousands of pintails, mallards, and other waterfowl en route to northern nesting areas. Minks, muskrats, beavers, and raccoons are found throughout the area, and bald eagles are often spotted along the river corridor during the winter.

Simply stated, the Missouri River is one of Montana's finest blue ribbon trout waters. Our knowledge of the requirements necessary to sustain the fishery will provide the basis for the future responsible management of this exceptional resource. ■

Montana Remembered

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thinning as we gained elevation. The gushing stream no longer kept us company, and its companionship was missed. Our fellowship was now with the mountain wind.

Night came again to court the mountains and we made camp, were stingy with our food, and turned in.

Rising with the sun, and again doing without much food, we went even higher into the mountains.

Moving rapidly, we found where a tree had blown across a stream. We crossed there, checked our map, found direction, and up, up into the high country we went. The higher we journeyed, the nearer we came to the sky and to the fullness of the land. We stopped once in a clearing spangled with flowers and made sweet with their breath. We were touching ground where few, if any men had ever trodden, save the Indian. We were in a place where we could give our hearts to the hawks. The higher we went, the deeper into solitude we plunged.

The air was sharper and thinner than ever. We were almost to our lofty place, although we had yet to lose the exhilarated thirst encouraged by the newness of all that was before us. The land, although made thinner because of a few trees and bolder with large rock outcroppings, held us close. We were totally delighted, for everything here belonged to us, and to us only. There were none other in receivership save us. None.

Ahead in the mountain's dome stretched a beautiful placid blue lake of perhaps three acres. There we made camp.

With firewood to see us through the night's cold, we set off for the last stretch of mountain. Up we went, until the lake below began to decrease in size. Standing on the mountain's summit, as all conquerors do, we surveyed chain after chain of mountains heaving themselves into sight. In all that mighty sweep of land, we saw no sign of man nor the handiwork of his kind. And we knew then, for certain, we had traced no man's step. If any were to follow, they would follow our path. We hurried back to camp.

A light snow fell during the night, and we could hear the flakes sputtering and dying in the fire that kept us company.

Morning's first light saw us busily fishing. The trout here were even hungrier than those we had found below. With one fast to the hook, others—I counted up to six one time—would ram the unfortunate one, even attacking the leader and fly line. Having enough of this, we rigged a fly with two trailing flies. Cast after cast would bring three bright, thrashing trout to shore. All were cutthroats. The day ebbed, and we had enough fish for our supper.

With trout frying golden in the pan, we ate shoulder to shoulder with the stars and the velvety sky. We drank our tea and turned in, for tomorrow we would leave the mountains. We would leave behind the beautiful lakes and streams, the thick green grass and blossoming flowers, the soft mornings and pleasant afternoons, and the pools where once upon a time we fished and made memories for such a time as now. Montana remembered. ■

Montana Muleys

continued from page 5

ty. Excessive *in utero* and summer fawn mortality may indicate poor range condition, stress caused by severe winter conditions, population overcrowding, or significant loss of fawns to predators.

Hunter harvest is determined at biological check stations during the hunting season and by the annual department hunter harvest survey. At biological check stations, department personnel record the sex, age, and location of kill for all deer checked. Sex and age are important. Without this information, the total number of deer killed would be of little use in evaluating effect of hunter harvest on the population since population trends are keyed to the age structure of the females. By the same token, biologists could not determine effects of hunter harvest on individual deer populations without knowing *where* deer were killed. The age of a deer is estimated by tooth replacement and wear or from an extracted middle incisor which is sectioned so the annual growth rings in the tooth's cementum layer can be counted, similar to aging a tree. When deer are killed in areas where special research projects are under way, hunters are sometimes asked to return the lower jaw to department personnel so that an age determination can be made. At biological check stations, jaw and antler measurements are also recorded and, in some cases, carcasses are weighed. These measurements are used by biologists to assess population condition trends.

Since the mid-1940s, an annual hunter harvest survey has been conducted by the department to evaluate hunting results for all game species (see John Cada's article, "Game Harvest Surveys: Asking Questions and Finding Answers" on page 8). The hunter provides direct information through a telephone interview or mail questionnaire. Information provided includes number, species, and sex of deer harvested, date and location of kill(s), and number of days spent hunting. Using the combined information from biological check stations and the hunter harvest survey, wildlife managers can estimate the number and sex and age classes of mule deer harvested, as well as distribution of harvest by location and time period (hunter pressure), number of hunters afield, and hunter success (number of deer harvested per hunter-day). These statistics are tabulated by hunting district (204 deer hunting districts are delineated in department hunting regulations), tag type ("A" or "B"), and hunter category (resident or nonresident).

The state's most popular and sought-after big game animal, the mule deer has been part of the Montana fabric of life for many generations.

Biological information is carefully collected so results can be statistically analyzed. Using computers for efficient processing of large amounts of information has become increasingly important. Biologists' ability to monitor and predict deer population fluctuations and to formulate appropriate harvest objectives has improved accordingly.

Season Structure

Formulating deer harvest quotas is a complex process entailing more than setting seasons on the basis of biologically determined harvest objectives. Season recommendations also include social considerations, such as land ownership patterns (public vs. private), landowner feeling about deer-caused property damage, landowner concern about hunter numbers, amount of land closed to hunting, and hunter demand for recreation. The relative significance of each of these social factors varies from one hunting district to another. Some of these considerations may even vary from year to year. For example, how much deer-caused damage to a haystack a landowner would tolerate is certainly influenced by current hay prices and hay shortages or surpluses. Biologists and wardens gauge these factors through contacts with landowners. As necessary, biologically allowable harvest potentials are adjusted according to social considerations.

The public is invited to comment on season proposals at regional public meetings sponsored by the department and at annual public hearings before the Fish and Game Commission. Hunting season recommendations finalized by the Commission are therefore a blend of biological, social, and political considerations.

The department issues two basic types of deer licenses. The deer "A" license, available in unlimited

MIKE ADERHOLD

MIKE ADERHOLD

Successful mule deer managemeot requires collection of many types of data: fawn birth rate and survival, fawn to doe ratio, and hunter harvest, to name a few. At biological check stations, data on sex, age, and location of kill are recorded.

numbers at license dealers, is considered a recreational license. During times when deer numbers are low, the "A" tag has traditionally been a buck-only license. However, when deer populations are high, the hunter is given the option of harvesting an antlerless deer; in some hunting districts, this antlerless deer may be either a mule or a white-tailed deer. The deer "B" license, geared specifically toward harvest of antlerless deer, is an important management technique. Deer population peaks can be dampened only through harvest of the productive female segment of the population. "B" tag quotas are allocated to hunting districts according to harvest objectives determined from biological information and socio-political considerations.

When deer populations peak—as is now happening in much of Montana—it is difficult to attain an antlerless harvest sufficient to slow population growth in some areas because of social hurdles, such as landowner tolerance for hunters. In addition, because of Montana's relatively low hunter density, the deer supply outweighs hunter demand during peak deer population years. Multiple "B" tags (which allow a hunter to harvest two or more antlerless deer) are issued to increase the potential harvest without increasing hunter numbers. Thus, multiple "B" tags are used to address landowner concerns about too many deer and too many hunters. Multiple "B" tags have also been used successfully to attract hunters from population centers to more isolated areas of the state. Without the incentive of being able to harvest two animals, many people are reluctant to travel great distances to hunt.

Quotas for "B" tags, issued through the department's special drawing, are finalized in August. Additional "B" tags are sometimes issued during the hunting season through department regional offices in response to anticipated or ongoing deer depredation problems, updated population estimates, changes in deer distribution, or changing social factors. Special "damage hunts" may also be held; the objective of these special hunts, set up in cooperation with the affected landowner, is to remove problem deer responsible for the property damage.

Research

Research has provided a foundation for mule deer management in Montana since 1941, when the Fish

and Game Commission adopted a policy of scientific wildlife management. Many field investigations conducted since have been cooperative efforts involving the Department of Fish, Wildlife and Parks, the biology departments at Montana State University and the University of Montana, the Cooperative Research Unit at UM, and other state and federal agencies. Mule deer research has attempted to provide answers to specific management problems through a better understanding of mule deer biology and behavior, habitat requirements, and population dynamics. Individual deer marked with colored ear tags, neckbands, or radio transmitter collars have provided valuable information to biologists seeking a better understanding of mule deer ecology.

Many people believe that deer populations are regulated through hunter harvest, but in fact, mule deer populations are set by environmental conditions.

In 1975, the department initiated a 10-year, in-depth research project aimed at improving deer management. Mule deer research efforts have focused on three study areas representative of three major habitat types: mountain-foothills (Bridger Mountains), prairie-river breaks (Missouri River Breaks), and prairie-agricultural (the Cherry Creek area near Terry). Findings in these ongoing investigations have continually been incorporated into the department's deer management program. An important finding has been that mule deer in different habitats exhibit unique population characteristics and therefore different harvest potentials. As a result, different management strategies have been applied to the deer herds occupying these various habitats. Findings have resulted in improved management of individual herds. Increased "B" tag harvests have resulted from better ways of estimating populations and determining the annual mule deer surplus. Research has also provided a much better understanding of year-round habitat requirements of mule deer populations.

Habitat

Although the Department of Fish, Wildlife and Parks is the legally designated manager of Montana's fish and wildlife populations, the habitat supporting this public resource is managed by private landowners (60%); federal agencies, mostly the U.S. Forest Service and the Bureau of Land Management (28%); Montana Department of State Lands (6%); and Indian reservations (6%). Habitat managed by the DFWP amounts to less than 0.3% of Montana's total area, and most of that is managed as big game winter range.

Until the 1970s, emphasis was placed on winter range as the habitat "bottleneck" which regulated deer populations. Research conducted more recently has placed new emphasis on year-round deer habitat requirements. Survival over the winter, for example, may equally depend on the amount of fat reserve a deer is able to accumulate during the summer and the availability and quality of winter forage. While the amount of fat a deer can store for winter reflects the quality of its summer range, the availability and quality of winter forage determines the rate at which fat reserves are used, and therefore the length of time that a deer can survive. In the case of migratory deer populations, summer and winter ranges may be many miles apart. Mule deer habitat, as it is shaped by deer behavior, is often a very challenging management issue.

Montana's deer populations are a product of the quality and quantity of habitat available to them. Perpetuation of suitable habitat is the bottom line in ensuring a future for mule deer populations. Deer habitat is constantly changing due to natural phenomena such as plant succession, as well as alteration or destruction caused by human activities and land use changes. Wildlife biologists employed by the department and by other state and federal agencies cooperate in assessing impacts to wildlife habitats so that wildlife needs are fully considered and incorporated into land management plans for public lands. Organizations such as The Nature Conservancy, the Montana Wildlife Federation, and various sportsmen's associations also play an influential role in wildlife habitat issues and decisions.

Mule Deer Management In the Future

Foresight and planning are integral components of resource management. As part of department planning efforts, biologists with special training in planning try to anticipate future demands on the wildlife resource. According to anticipated resource demands, planners formulate objectives to be addressed by new or improved management programs.

The task of managing mule deer populations is expected to become more challenging in the face of accelerated human pressure. An inevitable increase in Montana's human population will accentuate habitat loss due to intensified land uses and bring increasing demand for hunting. The problem of increasing demands on a resource supported by a shrinking habitat base will require development of new programs to encourage habitat protection on public and private lands and also to address the social considerations of landowner tolerance for both deer and recreationists. It is essential that sportsmen establish a good working relationship with landowners if deer hunting is to remain a Montana tradition. More efficient utilization of the deer herd will require better methods for obtaining population estimates and predicting population fluctuations. It will also be necessary to develop more effective means of distributing increasing numbers of hunters in relation to available deer. These problems will require innovative philosophical and technical solutions.

Montana residents have historically exhibited a strong concern for the welfare of the state's wildlife populations. Because wildlife is a public resource, public opinion strongly influences the direction of policies affecting wildlife populations and their habitats. Continued active public participation in wildlife issues is the key to maintaining mule deer populations and other wildlife species as part of our rich heritage. ■

mourning dove photo: ALAN NELSON

The Mourning Dove: MONTANA'S NEWEST GAME BIRD

by Dave Books

Around the first of September every year, the corporate officers of shotgun shell manufacturers around the country undergo a strange transformation. Mr. Winchester, not normally known to be a jovial fellow, is heard whistling a happy tune as he pores over the sales ledgers. Mr. Remington, by nature a dour and taciturn gent, is seen smiling kindly at orphans, stray dogs, and widow women. And Mr. Federal, hardly an athletic sort, is caught doing handsprings among the kegs of shot and powder in his factory.

What's going on? Simple, my friends, simple. The mourning dove season has begun. And nothing inflates the profits of the country's ammunition manufacturers (and deflates the egos of the country's wingshooters) like the mourning dove.

Each year, somewhere in the neighborhood of 40 to 50 million doves are harvested nationwide. Since it takes an average of at least three shots fired for each dove harvested, more than 150 million shotshells are expended at these little brown rockets annually. Dove loads retail for approximately 20 cents apiece, so that's $30 million worth of shotgun shells a year!

What makes the mourning dove the country's most popular game bird? It is abundant and widely distributed, for one thing; but what really seems to turn hunters on is the challenge of

photo: PAUL FIX

hitting the twisting, diving speedsters. Doves are said to cause unseemly words to pass the lips of even the most pious wingshots, and to drive otherwise stable scattergunners to the psychiatrist's couch. But you don't have to take my word for it—you can find out for yourself on September 8, when the season on Montana's newest game bird opens. The daily bag limit is 15 and the possession limit is 30, so take along plenty of shells.

Although the 1984 dove season promises to be the state's most widely heralded, it is not Montana's first. One or two dove seasons were held in the early 1950s, when the Fish and Game Commission had authority to set such seasons. But subsequent changes in state law required that the Montana Legislature establish the mourning dove as a game bird before hunting seasons could be held, and this was not accomplished until 1983. Last year's dove season, which opened October 1 (the date new laws customarily go into effect in Montana), was pretty much of a bust. Doves are early migrators, and almost all of them have left the state by the first of October.

Northern states have historically resisted classifying the mourning dove as a game bird, although this situation has been gradually changing in recent years. In authorizing a season for doves, Montana became the thirty-fifth state to do so. Idaho has had a dove season for many years, while Wyoming, North and South Dakota, and Nebraska are fairly recent converts. This slow but steady change in northerners' attitude toward the mourning dove has been brought about by a better understanding of dove biology and a heightened appreciation for its qualities as a game bird.

Despite tremendous annual mortality (60-80%), mourning doves number about 500 million by the start of hunting season each fall. Numerous studies have shown that hunting pressure has relatively little impact on the next year's population. Even in states that do not hold seasons, dove mortality from all causes still totals 60-80%. Thus, more and more northern states have opted in recent years to allow their sportsmen to share in the harvest.

Doves can sustain such high annual losses primarily because of their excellent reproductive capacity. They breed in every state in the continental U.S., as well as in southern Canada

and Mexico—and they raise several broods in a single season. Doves are capable of nesting almost anywhere; they prefer to build their loosely woven nests 5 to 25 feet off the ground in trees or on man-made structures, although in treeless areas they will nest on the ground. They adapt well to man's activities, nesting successfully in suburban back yards as well as throughout the rural countryside. The fact that mourning doves get along well with modern agriculture virtually assures that they will never follow the passenger pigeon—a related species once numbering in the billions—into oblivion.

Mourning doves usually lay two eggs per clutch (one per day), although occasionally they may lay three or even four eggs. The eggs hatch in two weeks, and two weeks later the young doves are fledged. This short reproductive cycle makes it possible for doves to produce several broods in a summer. Dan M. Russell, a wildlife biologist who wrote "The Dove Shooter's Handbook," kept records on 600 nests and discovered the average nesting success to be 49%. Some nests are abandoned before eggs are laid, but most losses involve predation on the eggs by other birds, or by squirrels, snakes, and miscellaneous wildlife. In most of the country, doves will make four to six nesting attempts in the course of a breeding season; since only half are successful, the usual production for a mating pair is four to six offspring per year.

Doves are born quite helpless, and depend entirely on their parents during the first two weeks of their lives. During the first week, the nestlings rely heavily on "pigeon milk" provided by both parents. This highly nourishing whitish liquid, secreted by glands in the walls of the parents' crops, is rich in calcium and several vitamins. The nestlings receive it by thrusting their bills into the open bills of the adults, who regurgitate the pigeon milk from their crops. The proportion of plant and animal food in the diet—primarily seeds, insects, and worms—increases daily, and after about five days the nestlings' diet is half solid food.

Doves that survive those first few vulnerable weeks and leave the nest to fend for themselves are by no means assured of a long and carefree existence. Predators (especially hawks), diseases, parasites, and freak storms all take their toll. Although doves have been known to live more than a decade in captivity, a three-year-old bird in the wild is a senior citizen.

Because mourning doves are migratory, they, like waterfowl, are subject to federal laws and regulations. Each year, the U.S. Fish and Wildlife Service establishes overall guidelines for seasons and limits, and the individual states then decide on specific dates and bag limits within this framework. Although dove hunters in Montana do not need a federal duck stamp, they must plug their shotguns so that they will hold no more than three shells. Shooting hours for doves this fall will be the same as for waterfowl: one-half hour before sunrise to sunset.

The U.S. Fish and Wildlife Service has divided the country into three units for purposes of dove management: eastern, central, and western. Montana falls within the central unit. The federal season and bag limit guidelines are based on a population index calculated annually from call-count surveys that encompass more than 1,000 routes across the country. These routes, which are usually located on lightly traveled back roads, are comprised of 20 listening stations spaced at 1-mile intervals. Each route is run once between May 20 and June 5, beginning a half-hour before sunrise. At each stop, the number of doves heard calling is recorded during a three-minute period (routes are not run on rainy days or when wind velocity exceeds 12 miles per hour). The number of doves heard on each route provides the basis for determining an index to population size during the breeding season.

In 1983, the average breeding dove population index for the United States as a whole was 19.4 doves per route. Based on the state's 15 routes, Montana's index was 11.4 doves per route. Data from 1973 to 1983 show Montana's breeding dove density to be relatively stable, varying from a low of 7.3 doves per route in 1974 to a high of 11.5 doves per route in 1977. While breeding dove densities for the nation fluctuated up and down between 1973 and 1983, the 1983 index was not significantly different from the 10-year average. The 1983 index was about the same as the 10-year average in the eastern management unit, up slightly from the 10-year average in the central unit, and down slightly in the western unit.

Biologists once feared that September hunting might interfere with late nesting attempts, and hence affect dove productivity. But an exhaustive study concluded it is unlikely that current dove hunting regulations, which allow hunting to start on September 1 in many states, have a significant effect on recruitment of

fledglings into the dove population.

This fall, hundreds of thousands of hunters across the country will take to the field in pursuit of mourning doves. Most of them will cuss and sputter their way through better than a box of shells to get a limit (usually 10 to 15 birds), and feel pretty proud of themselves at that. What makes the mourning dove such a tricky target? The truth is, at times you'd swear your shells don't have any shot in them, and at other times, when the moon and tides are favorably disposed, doves don't seem all that difficult. A lot depends on wind conditions, hunting pressure, the stand you've chosen, and where the doves are going and why.

No one disputes the fact that doves can breeze right along—they've been clocked at 55 miles per hour. But perhaps more exasperating is their often erratic flight pattern—what John Madson, author of "The Mourning Dove," refers to as the dove's "odd flickering quality." Madson admits that if you pick only the easiest shots, like doves fluttering down to land at a waterhole or in a tree, you can rack up a pretty good score. But taking your shots as they come, regardless of speed or angle, is an entirely different matter. According to Madson, "...when a cruising dove is fired upon, it may perform amazing acrobatics in the twinkling of an eye. No other game bird has such a dazzling change of pace. I've seen doves do a complete roll in the process of turning and diving....Unless one has hunted doves, he can have no idea of how agile they really are—or how fast."

I found this out for myself one windy September afternoon a few years back near Valentine, Nebraska. Jon Farrar, Clark Gotchall, and I had taken up stands at strategic locations around an abandoned homestead—me in an opening in a wooded area not far from a dilapidated barn, Jon in a hemp patch at the site of an old corral, and Clark near a pasture at the opposite end of the hemp patch. It wasn't long before we had action; most of my shots were at birds coming in fast over the trees from behind me, or at birds coming in high and straight toward me. I soon had a sizable pile of empty shells at my feet (I won't say how many), but I also had nine doves—one short of the Nebraska limit. I wanted that tenth dove badly, but I was having trouble connecting with it.

Eventually, Jon and Clark, who were beginning to think seriously about dinner, sauntered over to my stand to lend moral support. A dove whistled by at close to the speed of sound; I missed. Clark grinned. A gray-brown missile twisted in over the treetops to my left; I missed again. Jon snickered. A brown bombshell came straight at me from out of nowhere; I couldn't find the safety. My Brittany spaniel sighed. Finally, the matter came to a head.

Most dove hunters will cuss and sputter their way through better than a box of shells to get a limit (usually 10 to 15 birds), and feel pretty proud of themselves at that. What makes the mourning dove such a tricky target?

Jon said, "Books, we're leaving now. You can stay here all night if you want. It's only a five-mile walk to the camper." Just then, another dove flickered into view. I threw my 20 gauge to my shoulder and fired, and the dove collapsed in a bundle of feathers. Everyone cheered but the dog—he was busy retrieving the dove.

How will dove hunting in Montana stack up in comparison with other states? If you've read about dove hunting in the South, where the sport is a long-standing tradition as well as a social occasion, you know that the shooting there is often spectacular. Dozens of hunters sometimes surround a single field, and hundreds of doves may be bagged in a short time. But southerners experience this type of shooting largely because the doves concentrate as they move south. Montanans are not likely to see such large flocks of birds, since doves will be scattered throughout the state when the season opens.

Parts of western Montana have good numbers of mourning doves, but the eastern two-thirds of the state should provide the best shooting. Southeastern Montana should be excellent barring an early fall storm, partly because dove production increases as one approaches the Dakotas and partly because the southern counties should hold doves a little longer than those farther north.

Hunters scouting for doves should concentrate their efforts in the morning and evening, because that's when the birds are most active. They seek food during these periods—primarily grass and weed seeds, waste grain, sunflower seeds, etc.—then fly to water for a drink. They prefer to land a ways from water and walk to it, so ponds with flat, open shorelines are best. Shortly before dark, or sometimes just after, they fly to roost trees.

Successful dove hunters will have followed the birds' activity patterns prior to hunting season, obtained the necessary permission from landowners in advance, and located a suitable spot to shoot from. An elaborate blind isn't necessary, but wearing clothes that blend in with the surroundings will help, as will keeping still until you are ready to raise your gun and fire. Most hunters favor 12 or 20 gauge shotguns with No. 7½ shot.

A retriever is a great aid in finding downed birds, since doves are difficult to recover, especially in heavy cover. If you don't have a dog, mark each fall as carefully as possible, go directly to the spot, and search in circles until you find the bird. The gray and buff colors blend in well with most backgrounds, and you won't exactly trip over these diminutive game birds, which weigh in at about five ounces.

But the dove's small size does not detract from its desirability as table fare. It just takes a few more of them to make a meal. The meat is dark, rich, and delicious. When you shoot a dove, don't put it in a plastic bag or airtight game bag. Put the bird in the shade, where air will circulate around it—or better yet, in a cooler (but not in ice water). The faster it cools, the better it will keep. Most hunters feel that doves are tastier when they are plucked with the skin kept intact.

With ten upland game birds to choose from, Montanans have bird hunting opportunities of nearly every type and description. But for a special wingshooting challenge, Montana's newest game bird may top them all. ■

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